PNEUMONIA AND THE PNEUMOCOCCUS.

A Clinical Study.

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INTRODUCTION:- During my term of office as House-physician and Pathologist to the Northern Hospital, Liverpool, I have had considerable opportunities of studying both from a clinical and pathological standpoint many cases of pneumonia and from observations founded on data thus obtained and from a study of the modern views of the disease, I venture to submit as a thesis the following:- By incontrovertible arguments, it is generally agreed that pneumonia is a specific febrile disease, the lung inflammation being only a symptom. Formerly, it was thought that the lung mischief was the primary cause of the disease, and that all other symptoms followed secondarily to it. Now, the consensus of opinion follows in another direction and that trend of thought is supported by some very strong arguments. It is a specific fever running a well-known and definite course ending by a crisis or in some instances, though uncommonly, by lysis; it is in no way dependent on the stage of the lung mischief or on the extent of the pulmonary tissue in-

volved. After the fever has subsided, the lung may be solid, while during the fever the pulmonary physical signs may have been very few in number. Then we have to consider the infectious nature of the malady, and also the relationship of a certain organism or organisms, which are stated to play some part in the causation of the disease.

The micro-organisms (1) in question are two, namely:-

(1). The micrococcus of sputum septicaemia (Frankel), micrococcus pneumoniae crouposae (Sternberg), or diplococcus pneumoniae (Weichelsbaum).

(2). Pneumococcus (Friedlander) or bacillus pneumoniae(Flugge).

The former is now generally recognised as the usual agent in the production of acute pneumonia. It was discovered by Sternberg (2) of the United States Army, in September 1880, in the blood of rabbits inoculated with his own saliva. Talamon in 1883 demonstrated the presence of this micrococcus in pneumonic sputum while Sternberg himself in 1885 identified it with Micrococcus of rusty sputum of pneumonia by comparative inoculation and culture specimens.

The second pneumonic micro-organism was obtain-

ed in 1883, by Friedlander in pure cultures from the exudate into pulmnary alveoli in cases of croupous pneumonia. Subsequent researches show that this microbe, in shape a short rod with rounded ends; hence called bacillus pneumoniae by Flugge(3), is present in only a small number of the cases,-9 times in 129 cases examined by Weichelsbaum, 3 times in 70 examined by Wolf; Emmerich, has demonstrated the presence of this organism in the soil of a room in which there were many pneumonia patients.

Out of 27 cases which I examined, in 22 cases Frankel's organism was present, while in 5 cases streptococci were present, in one case it was also found in the conjunctival discharge. In not a single case did I find Friedlander's organism. Hence it is that I will deal with Frankel's organism alone, discussing its casual relationship with pneumonia and its presence in lesions in other parts of the body.

This organism occurs usually in the form of cocci and is found generally in pairs; hence the characteristic name diplococcus. It sometimes may be seen in chains. Commonly, it measures approximately 1 μ in diameter. Making rapid film preparations, I generally used carbolfuschin, staining

for a few seconds in the case of film preparations, the capsule being seen as an unstained halo round it. It stains well by Gram's method, thus distinguishing it from the gonococcus and Friedlander's organism. The capsule usually stained well with an alcoholic solution of Eosin 50%, and latterly I used a method described by MacConkey of Guys :- Dahlia 0.5 gramme, methyl green (O O Crystal) 1.5 gramme; saturated alcoholic solution of fuschin 10 cc; distilled water to 200 cc. The dahlia and methyl green are rubbed up in a mortar with part of the water until dissolved. Then, the fuschin added, then the rest of the water. staining: Prepare the film in the usual way. Flood the cover slip with the stain & heat until the steam begins to rise. Then place aside for five minutes, wash in water, dry & mount in Xylol balsam. This method brought out the capsule very well. Agar-agar covered with a thin film of rabbits' blood as recommended by Eyre and Washbourn is a very good culture medium and the growths are said to retain their virulence for a long time. Agar-agar made up with Asciticfluid is also a very good medium; but I found the organism grow very well on plain agar-agar at a temperature of 30-37°C., giving in 40-48 hours an appearance

like minute drops of water, while some were larger and became pearly. There were no inoculations performed. The most successful results are obtained when the cultivations are made early on in the disease.

And now as to evidence of the occurrence of the pneumococcus in the human subject. Weichelsbaum (5) found this organism in 94 cases out of 129 cases of pneumonia; and he also affirms that it is present in 90% of pneumonias. Out of 27 cases of pneumonia examined by Monti(6), he found pneumococcus present by itself in 15 cases, along with the staphylococcus in three more and with the streptococcus in one case. Gamaleia (7) found it in 12 fatal cases and Goldenberg in 40 successive cases. Dr West (8) found the pneumococcus present in 67 out of 118 cases of broncho-pneumonia which he collected. But as I shall say later the pneumococcus has been found in the buccal secretions of individuals in a state of health, and the above cannot alone prove that the presence of the organism bears a causal relationship with the disease. Now if we superadd a fact which has a great bearing on the question of immunity and upon which lies the fundamental rationale of the most recent mode of treatment, viz., that serum from patients convalescent

from pneumonia has the power of protecting rabbits against inoculation and that that protection, from our present knowledge is always specific to the one organism, there is little reason to doubt that a causal relationship does exist.

Not alone in the lungs & sputum do we find this organism present but it has been found in various other lesions, though it has a special predilection for the lungs. The role of this organism is not limited, as it has been thought, for indeed we may have a general infection by this organism constituting a true pneumococcic septicaemia; but of course in connection with this we have to take into consideration the varying virulence of this organism, which I shall endeavour to explain later.

If we look at its occurrence in other parts of the body we find that, next to the lungs, the pneumococcus most frequently exists in the meninges. Netter (9) investigated a large number of cases and arranged the following tables of the relative frequency of the primary infections by the pneumococcus in man

(1) In Adults

Pneumonia		65.95%
Broncho-pneumonia Capillary bronchitis	...	15.85%

Meningitis ... ... 13·

Empyema 8.53

Otitis 2.44

Endocarditis 1.22

Hepatic Abscess 1.22

(2) In children, 46 cases,

Otitis Media ... ... 29 cases

Broncho-pneumonia ... ... 12 cases

Meningitis ... ... 2 cases

Pleurisy ... ... 1 case

Pericarditis ... ... 1 case.

Thus in children otitis media was the most frequent lesion.

Frankel (10) gives the following list of authorities for the presence of the pneumococcus in cases other than acute lobar preumonia:-

Nearly always in acute cerebro-spinal meningitis (Bordoni-Uffreduzzi)

Some cases of Pleurisy.....(Frankel)

" " " Peritonitis..(Weichelsbaum)

" " " Pericarditis.(Banti)

" " " Endocarditis and Otitis Media.

Cases of osteo-arthritis caused by pneumococci have been recently noted. At a meeting of the Société Médicale des Hôpitaux of Paris in November,

Dr Fernet (11) described two cases which had come under his notice, the sterno-clavicular joint being attacked in both. The onset was sudden and attended with severe pain and considerable swelling. In one case the joint became disorganized, terminating by fibrous anchylosis in two months. The second case terminated fatally in three weeks, there being in this instance pulmonary and meningeal infection. In both cases, fluid from the joint gave a pure cultivation of the pneumococcus. It is interesting to note in connection with this, a case of arthritis occurring in cerebro-spinal meningitis with pneumonic symptoms noted by Osler in the Boston Medical and Surgical Journal, December 29th 1898, and the diplococcus intra-cellularis was found in the fluid of the joint and seemed to him to be evidence of a general diplococcus septicaemia; so also may that fact be argued in the case of pneumococcic arthritis.

A variety of conjunctivitis due to the pneumococcus has been described and in one case of my own, I succeeded in cultivating this organism from the discharge from the inflamed conjunctiva.

M. Duplocq and M. Lejonne,(12) at the meeting of the Société des Hôpitaux of Paris, Nov.25th 1898, related a case which illustrated very well an instance of

generalised pneumococcic infection in a case of pneumonia:- The patient was a robust man aged 59,with consolidation in the left axillary region and bronchitis in the right lung. On the ninth day a second focus of consolidation appeared at the left base and he expectorated for the first time two thick masses containing numerous pneumococci and in the course of his illness which lasted thirty-three days, he had five or six abscesses in various parts of the body, which on bacteriological examination yielded cultures of the pneumococcus. The blood also contained pneumococci. On post-mortem examination, signs of recent pneumonia & meningitis were found, the exudate containing pneumococci. The presence of the pneumococcus in several of the lesions was verified by the fatal effects of injecting mice.

Osler states that an acute general infection with the pneumococcus without localised foci may prove rapidly fatal and quotes a case reported by Townsend of a girl aged 6 who had pain in the abdomen, vomiting and a temperature of 104.2. Twenty-four hours from the onset of the symptoms she had a convulsion and died six hours later. There was found post-mortem a general infection with the pneumococcus, which occurred in the blood, lungs, spleen and kidneys.

In 1894 Drs. Brodie,Hamilton,and Rogers (13) reported in a paper read before the Transvaal Medical Society, the result of an investigation of 100 cases of what they termed "Acute Specific Rhinitis." The main features of this disease were purulent discharge from the nostril and in many cases pneumonia. It occurred as an epidemic and there was a mortality of 15%. They made nine post-mortems and found one constant condition present - a livid, injected swollen condition of the pituitary membrane, the sphenoidal and ethmoidal cells being in some cases bathed in pus. In one case the diseased mucous membrane had exfoliated and sloughed away. Some cases had pneumonia, some had jaundice, others had meningitis. From the study of the epidemic, they came to the conclusion that it was the result of a poison circulating in the blood, infecting first the nasal region and causing death by the toxaemic condition it produced, the meningitis and pneumonia being secondary - due to the poison circulating in the blood.

Last year, they published a further account of their investigations on this subject, dealing with an epidemic which occurred in a batch of 800 Kaffirs working in the mines at Johannesburg. The clinical

symptoms observed resembled those of the previous outbreak :- nasal catarrh, coughing associated in many cases with lobar pneumonia, pleurisy, parotitis, diarrhoea in some cases dysenteric in character, sometimes in the fatal cases simulating the motions seen in purpura. The disease ran a short course, and in several instances definite signs were absent, the person being found dead.

They made post-mortems in 26 cases. In all cases after death they found a purulent nasal discharge. The nasal mucous membrane and sinuses showed every stage of inflammation from hyperaemia to exfoliation of the nasal mucosa. Meningitis, purulent in character, was also found in 12 cases; otitis media in one case. Lobar pneumonia was present in the majority of cases. Pleurisy, with scanty effusion, in several; sometimes thrombosis, perihepatitis and perisplenitis; but no gross change in the intestine. Parotitis was also noticed.

A complete bacteriological examination was made in 15 cases. They made cultivations from the, (1) pus in the nasal fossa and sinuses, (2) Spinal and cerebral membranes, (3) fluid in the cerebral ventricles, (4) pericardial, pleuritic and peritonitic fluids, (5) heart blood and blood in the cerebral

venous sinuses, (6) Lung, kidneys and spleen.

The chief organism obtained was one which in its microscopical and cultivation characters was identical with the pneumococcus. In cultivation experiments they obtained the above organism in pure culture from either the spleen, the pericardial fluid or the heart blood of 7 cases. In some, they obtained the organism in pure culture from all the three sources named. In the remaining eight, they obtained no organism of any kind in these tissues. In two cases, they obtained pure cultures of the organism from the cerebral exudate. In five others, it was associated with staphylococci and streptococci. They also verified their results by inoculating animals.

From these experiments, they concluded that the organism was Frankel's organism but probably a more virulent form, and that it caused cerebro-spinal meningitis, first affecting the mucous membrane of the nose, and then producing the various other lesions by extension along the various anatomical channels of infection.

Thus, we can easily note from the above how protean the manifestations and how many and varied are the changes which are associated with the pre-

sence of this micro-organism. But, how does this come about ? Briefly, it must necessarily arise from individual predisposition or from a varying virulence of the micro-organism itself.

As regards the individual predisposition to this disease, taking the average individual it must be plain that there is no special liability for one person to be attacked more than another, and I think that pneumonia must be ranked amongst those diseases produced by the action of specific poisons to which in a sense it may be said there was a univeral predisposition. Of course, I am dealing with the normal individual, not with those in which there is some predisposing cause, and which are therefore abnormal.

Comparing the effect of inoculation (14) in different animals, we find there is a great difference in the results and that a scale of the relative predispositions can be tabulated.

When a culture of the pneumococcus is injected into the most susceptible animals, and these are the mouse and the rabbit, pneumonia is not the disease produced but a septicaemia and death occurs generally in from twenty-four to forty-eight hours, and the blood is found to contain these pneumococci

in large numbers. The guinea-pig is also very susceptible but not so much as the mouse and rabbit, it requiring a larger dose to produce the same symptoms. The rat comes next in having a relatively lower susceptibility. Sheep show a marked immunity and when inoculated subcutaneously an enormous sero-fibrinous exudation occurs at the seat of inoculation and very few pneumococci are found in the blood. A typical pneumonia, generally termimating fatally, follows intra-pulmonary injection of a culture of the pneumococcus in the case of the sheep. In the case of the dog, a fibrinous pneumonia, occasionally fatal, follows intra-pulmonary injection. The pigeon is said to be immune.

From the above Muir & Ritchie have come to the following conclusions:- that in the more highly susceptible animals virulent pneumococci produce a general septicaemia, whereas in the more immune species there is an acute local reaction at the point of inoculation, and if the latter be in the lung, then there may result pneumonia, and that it is justifiable to suppose that man occupies an intermediate space in the scale of susceptibility, probably between the dog and the sheep, and that when the pneumococcus gains an entrance to the lungs, the local

reaction in the form of pneumonia occurs.

Following on the above statements, coupled with the multiplicity of lesions associated with the presence of the pneumococcus, we ask ourselves the question;- can they be accounted for by a varying susceptibility to the disease ? Evidence seems rather to negative this suggestion; though if we look at the occurrence of some other acute infectious diseases in localities where such a disease has been unknown, we have evidence of varying susceptibility. Thus, in 1846, the poison of measles having being conveyed to the Faroe Islands, where it had been unknown for 65 years, the disease rapidly spread amongst the inhabitants affecting old and young alike; more than 6000 persons, out of a total of 7782, were attacked by it in the course of six months, and scarcely any escaped, save the few aged persons who had been affected when young in the previous epidemic, and the inhabitants of one of the smaller islands, who kept up a rigid quarantine. The cases of acute specific rhinitis, occurring at Johannesburg, though dissimilar in many respects, bear some relation to this point, and seem to indicate a change of situation and mode of living, having something to do with the outbreak.

It will be admitted that the case for the varying susceptibility in man, is a weak one; so we have to turn to the varying virulence of the organism to find out the cause of the multiple manifestations of disease due to the pneumococcus.

The virulence of micro-organisms varies greatly in different conditions, and their virulence can be diminished or increased by various methods of culture and inoculation. Widely different effects may be obtained by simply altering the virulence of an organism. A streptococcus, which usually produces a local suppuration, may, when increased in virulence, produce a rapidly fatal septicaemia, and it is easy to believe that such is the case with the pneumococcus. In some cases, we have a simple lobar pneumonia, or we may have as has been noted by some authors, a condition akin to pneumococcic septicaemia. Even in cases of lobar pneumonia, one cannot fail to be struck with the varying degrees of toxaemia present in the different cases.

Not only have we pneumococci of varying virulence but we also have different species of this organism. Eyre & Washbourn (15) have described varieties of this organism differing, not only in virulence, but also in biological characters. At one end of the

scale they place the parasitic type:- the typical pneumococcus of the text books. This type leads with difficulty a saprophitic existence; it will only grow at temperatures approaching that of the human body; it will not grow upon media which are faintly acid, and rapidly dies out when cultivated upon agar or broth. Rabbits, inoculated with this type, die from septicaemia, and the blood after death is found to be crowded with pneumococci. At the other end of the scale is the saprophitic type; it grows well on cultured media and retains its vitality for a long time. Kruse and Pansini (16) also give a long list of minor varieties, some of which had the faculty of forming peptones, and others, of forming pigments, yellow or brown. Fowitzky, quoted by Washbourn (17), separated a variety and which constantly produced pneumonia in rabbits, by inoculation. Other varieties have been described by Foa. Washbourn found that one race of pneumococci leading a saprophitic existence in the mouth possessed a low capacity for acquiring and a low capacity for retaining a high degree of virulence and that there existed intermediate forms between the two varieties.

Now as to a summary of the preceding statements:- We have seen how this disease is almost constantly associated with the presence of a certain micro-organism and the evidence adduced as to its causal relationship with pneumonia; various lesions have been described with which the presence of the pneumococcus has been associated; finally, it has been shown that there are different varieties of this organism, differing not only in biological characters and in initial virulence but also in the power of acquiring and retaining a high degree of virulence; and to what conclusion do we come ? It must be fairly plain that the ultimate possibilities of pneumonia are not so few in number as has been thought, and that recognition of the above facts will form a basis for a rational view of the disease, leading to further and more thorough research into those complications and sequelae of the malady under consideration, which have hitherto been dealt with apart, and that it is possible to have all varieties of disease due to pneumococcic infection from a simple lobar pneumonia, nay, even a benign form of conjunctivitis to a true pneumococcic septicaemia.

C A S E S

The following are the notes of a series of cases which I had under my care:-

CASE 1.

R. N., seaman, age 42.

Admitted April 14th 1898, complaining of pain in the side and cough. Right basal pneumonia; sputum rusty, viscid, contained abundant pneumococci; pulse throughout, fair; had an attack of moderate severity; made a good recovery. Urine during disease contained albumen, no diminution of chlorides: Erhlich's reaction well marked. Discharged May 12th.

Treatment:- Ammon. Carb. 10 grains, four hourly; no stimulants.

Patient had a strong alcoholic history.

CASE 2.

P. B., dock labourer, age 38.

Admitted July 19th 1897, complaining of pain in the side. Initial rigor three days previously; strong alcoholic history; under its influence when he applied for admission; has a left basal pneumonia; pain inside very intense; some dry pleurisy present. Urine showed trace of albumen; chlo-

rides normal; Erhlich's reaction not present.

Treatment:- Ammon. Carb. 10 grains, four hourly;
Ice bag for pain in the side. No
stimulants.

Made a good recovery; discharged August 11.

CASE 3.

T. H., dock labourer, age 45.

Admitted April 13th 1898, complaining of feeling "very bad" and pain inside. He stated that about a week ago he received an injury to his chest, being crushed between two barrels, while working at the docks, and dated his present illness from the accident. After this he became depressed & ill, got worse and applied for admission. Some enlargement of the left side of the cardiac area, and consolidation of left apex and right lower lobe Urine contained albumen, chlorides greatly diminished. Erhlich's reaction not present. Sputum contained numerous pneumococci.

Treatment:- Ammon. Carb. 10 grains, four hourly,
No stimulants.

Made a good recovery; discharged May 12th. The noticeable feature in this case was the history of traumatism.

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The next case having several points of interest is given in full; most of the cases are given in brief, the charts, pulse tracings etc are given at the end of the list of cases.

CASE 4.

J. P., seaman, age 53.

Admitted April 5th 1898, complaining of pain in the side and "feeling bad."

History:- Patient, a sailor, heavily built man, gave a strong malarial history, also that of venereal disease: has been troubled from time to time with angina like attacks. He stated that he had a shivering attack the morning of admission.

Physical examination:- Heart: apex beat 5th interspace immediately internal to left nipple. On auscultation:- mitral area:- 1st sound loud, 2nd, faint, no bruit. Tricuspid area:- systolic bruit heard indistinctly. Pulmonary area:- loud systolic bruit and accentuated 2nd. Aortic Area:- loud systolic bruit, propogated up the carolids. Blood was examined for the malarial parasite; some granules of pigment were seen in one or two of the white cells, leucocytosis was marked; several of the red cells in the field showed small clear areas containing pigmented bodies.

Lungs:- left lung showed a resonant note all over, breath sounds were normal. Right lung:- percussion note from angle of scapula downwards was hyper-resonant: ausultation showed friction and fine crepitations over same area; cough was of a short hacking resultless nature and caused him great pain in right side; sputum, viscid rusty contained swarms of diplococci on examination; pulse 120, showed a tendency to dicrotism; resp., 36; temp., 104.8.

Calomel 4 grains was ordered, and as he was very restless chloral 10 grains, Tinct.Digitalis 5 were given 12 midnight. Ammon. Carb. 10 grains, four hourly.

Diet:- milk, 4 pints Bovril Eggs Quinine four hourly. For the pain:- Ol. Sinapis.Sem. ordered to be rubbed on.

April 6th. Examined patient this morning and found dulness just commencing below the angle of the left scapula, seemed fairly comfortable.

Temp., 101.4; pulse, 100, low tension, shows tendency to dicrotismand tracing taken; Urine, contains albumen, chlorides not diminished. Erhlich not present. Took a slight rigor about 4 p.m., and had a mild malarial attack. Temp., rose to

104.8.

Quin. Sulph. 5 grains, brought down the temp. to 99.8, 4 a.m. the following morning.

April 7th. Seems very comfortable, no cyanosis or distress - had a very fair night :- nurse reports that he tried to get out of bed once during the night. Examination of chest:- right lung solid from angle of scapula downward, tubular breathing heard all over. Vocal fremitus and resonance rather diminished (probably thin layer of fluid). Pulse 120, tension very low, tracing taken; resp., 32; temp., 102. Urine contains albumen, chlorides undiminished. Erhlech's reaction well marked.

April 8th., 12-30 a.m. Patient comfortable. Pulse 110 and improving; resp., 24; taking his nourishment well; slept in snatches; seems rather inclined to wander; but answers questions intelligently.

" 10.30 a.m. Patient had a fairly good night and slept well; this morning is delirious, and tries to get out of bed. Lower lobe of right lung solid, tubular breathing broncho-phonic resonance. Left lung quite resonant. Pulse improving 112; resp., 36; urine contains albumen, chlorides undiminished. Erhlich's reaction well marked.

April 9th., 12-30 a.m. Pulse 120 shows a tendency

to run and is much weaker; patient restless, trying to get out of bed, delirious; taking nourishment fairly well.

Ordered Strychnin. Nitrat. gr. 1/32.

" 10-30. Patient doing very well; pulse 108, even regular and much better, tracing taken, tension improving, resp 36, temp 101.8. Urine:- Albumen; chlorides absent. Erhlich well marked. Physical signs about the same.

April 10th. Patient's condition very satisfactory. Temperature 100 and gradually falling; pulse 104 improving and regaining its aortic character; resp., 32. Urine, albumen; chlorides still absent. Erhlich's reaction still marked. Redux crepitations heard at base of right lung.

April 11th. Temp., 97.8; pulse 88 fairly good; resp., 28. Chlorides returning to urine. Erhlich's reaction becoming fainter, albumen very small in amount. Can have a little tea, bread & butter. Stopped Ammon. Carb., and all drug treatment. Redux crepitations more numerous.

April 12th. Temp. 97.8; pulse 88 fairly good; resp., 28. Redux crepitations all over the consolidated area. Urine:- faint trace of albumen, chlorides normal. Erhlich's reaction still faint.

April 13th. Physical signs about the same; temp., 96.5; pulse 88; resp., 28. Put on milk diet & coffee.

April 14th. Still improving. Erhlich reaction gone.

April 17th. Still a little dulness, redux crep. fewer in number; no albumen in urine. Patient's convalescence was slow and it was not till April 29th that the physical signs had disappeared.

May 12th. Patient discharged.

The case was an interesting one from the occurrence of pneumonia and malaria in a man suffering from an aortic lesion fairly advanced in years. No stimulants were used in the treatment.

CASE 5.

J. K., dock labourer, age 23.

Admitted April 22nd 1898 complaining of pain in the side and cough. Initial rigor four days previously. Pneumonia of the right base with all the typical physical signs. Sputum contained numerous pneumococci and had had the characteristic appearance. Urine showed diminished chlorides on 6th and 7th days, albumen present during the febrile period. Erhlich's reaction not obtained. Crisis on the eighth day. Discharged May 16th. Treatment:- Ammon. Carb. 10 grains, four hourly.

No stimulants were used.

CASE 6.

J. F., porter, age 30.

Admitted February 4th 1898. Initial rigor four days previously, complained of feeling "ill". Physical signs of pneumonia of the lower lobe of left lung well established. Sputum contained pneumococci and was of the usual rusty appearance. Had his crisis on the eighth day. During his illness he was very ddelirious. Urine contained albumen during the febrile period, chlorides not diminished. Erhlich's reaction marked. Had a slow convalescence and was discharged March 7th, there being still a few crepitations at the base of the left lung.

Treatment:- Ammon. Carb. 10 grains, four hourly. Brandy 6 oz, champagne 8 oz during the twenty-four hours. For the delirium, Chloral 15 grains, Tinct. Digitalis 10 m. were given as a sedative.

Fairly severe attack. Was interesting from the fact that he was admitted within six months suffer- from a left basal phthisis and enteric.

CASE 7.

T. T., school boy, age 9.

Admitted May 11th 1897, complaining of pain in the left side and "feverishness". A few crepitations were heard in the left infra-axillary region. Systolic bruit heard best at the junction of fourth left costal cartilage with sternum. History of initial rigor two days previously. Next day, dulness at left base up to level of 6th dorsal vertebra, and all the typical signs of a pneumonia in that region developed. Slight delirium. Urine during fever showed only a trace of albumen, chlorides not diminished. Erhlich's reaction not present. Discharged June 3rd; systolic murmur unaltered.

Treatment:- Ammon. Carb. 4 grains, four hourly, no stimulants.

Case interesting because of having second attack within 14 months.

CASE 8.

P. L., school boy, age 11.

Admitted January 10th 1898, complaining of pain in the chest. Poorly nourished lad, right apical pneumonia. Initial rigor four days previously. Discharged February 4th. No treatment necessary.

CASE 9.

D. K., seaman, age 46.

Admitted May 22nd 1898, complaining of feeling "ill". Initial rigor three days prior to admission. History of alcoholism and malaria , consolidation of the whole of the right lung. Sputum rusty in colour, and contained multitudes of pneumococci. Patient did very well. Crisis on 7th day; pseudo-crisis on the 6th. Urine contained trace of albumen, chlorides diminished on day of admission. Erhlich's reaction not present. Discharged June 28th.

Treatment:- Ammon. Carb. 10 grains four hourly.
No stimulents.

CASE 10.

M. T., no occupation, age 27.

Applied for admission July 31st 1898, examined in out-patient room. History of initial rigor five days before. Temp. 104; pulse 120; resp. 30. Dulness and crepitations at both bases. Was sent up-stairs. Half an hour after admission temp. 97.8; pulse 80; resp. 26. Lungs cleared up rapidly. Discharged August 8th.

Treatment:- Nil.

Patient had passed through an attack of double pneumonia while at her house work, untreated, and was having her crisis at time of admission.

CASE 11.

H. D., school boy, age 13.

Admitted April 30th 1897, complaining of pain in chest, temperature being raised. Until the 4th May nothing definite could be found, then a little dulness was found at the outer side of the right apex, and latterly the upper lobe of the right lung became consolidated. Sputum not examined. Urine showed trace of albumen, chlorides normal. Erhlich's reaction absent.

Treatment:- Ammon. Carb. 4 grains, four hourly. Cold sponged when temperature was high. No stimulants.

CASE 12.

J. R., messenger, age 14.

Admitted November 4th 1898, complained of feeling "ill". Initial rigor four days before. Left basal pneumonia with all the attendant physical signs. Discharged December 15th.

Treatment:- Ammon. Carb. 4 grains, four hourly. No stimulants.

Case was mild in character. Had pneumonia three times before. This was the fourth attack.

CASE 13.

R. D., factory hand, age 18.

Admitted March 30th 1898 in a condition of torpor; evacuations involuntary: pupils contracted. On examination, left basal pneumonia. Next day signs of commencing consolidation of base of right lung were found. Sputum scanty, viscid in character contained pneumococci. Urine during attack contained albumen, chlorides diminished. Erhlich's reaction well marked. Patient had a very severe attack of double basal pneumonia from which he recovered and was discharged April 18th.

Treatment:- Ammon. Carb. 7 grains, four hourly. Pulv. Ipec. Co. 10 grains, when restless. Cold spunging when temperature was high. No stimulants.

Condition on admission seemed to show a well marked toxaemic condition.

CASE 14.

E. S., police-constable, age 36.

Admitted May 9th 1898 in a delirious condition suffering from double basal pneumonia. Initial rigor five days previously. Very strong alcoholic history. Pulse, rapid and dicrotic. Urine faint trace of albumen, chlorides normal. Erhlich's reaction present. Crisis, 7th day; discharged June 6th .

Treatment:- Liq. Strychninae 5 m. four hourly.
For the delirium, Chloral 15 grains,
Tinct. Digitalis 5 m.

CASE 15.

J. B., brick-setter, age 17.

Admitted December 16th 1897, complaining of pain over epigastrium. Gave a history of a fall on the chest on the 9th. Initial rigor on the 11th. He developed a left basal pneumonia with the usual physical signs. Sputum characteristic and contained pneumococci. Urine, albumen during the febrile period, chlorides diminished. Erhlich's reaction well marked. Crisis on the 7th day and a satisfactory convalescence. The case was complicated by jaundice and diarrhoea. Discharged Jan. 24th.

Treatment:- Ammon. Carb. 6 grains, four hourly.
No stimulants.

CASE 16.

J. P., dock labourer, age 22.

Admitted September 25th 1898, complained of feeling "ill". Initial rigor five days before. Pneumonia of lower lobe of right lung. Sputum rusty containing pneumococci. Pulse rapid, hyper-dicrotic Urine: during illness, contained albumen, chlorides not diminished. Erhlich's reaction present.

Treatment:- Liq. Strychninae 5 m., four hourly.
No stimulants.

Pulse tracings taken show gradual improvement of the pulse.

CASE 17.

F. F., fireman, age 28.

Admitted November 5th 1898, from the R. M. S. "Lucania". Initial rigor October 30th. Patient had left basal pneumonia. Sputum rusty, contained pneumococci. Delirious. Crisis 9th day, followed by rapid convalescence. Urine, during attack, albuminous, chlorides normal. Erhlich's reaction present. He had a strong alcoholic history.

Treatment: Ammon. Carb. 10 grains, four hourly. Chloral 15 grains, Tinct. Digitalis 5 m. No stimulants.

CASE 18.

T. J., cabman, age 22.

Admitted April 26th 1897. Initial rigor five days before. Left basal pneumonia. Sputum rusty in colour contained pneumococci. Crisis the eleventh day, succeeded by rapid convalescence. Delirium present, more marked at night. Urine: no albumen, chlorides diminished; Erhlich's reaction absent. Discharged May 19.

Treatment:- Ammon. Carb. 10 grains, four hourly. Sulphonal 30 grains at night for the delirium which it only partially succeeded in subduing.

Case ran a fairly normal course, until two days after the crisis, which was prolonged, when patient had an attack of delusional insanity. He remained thus for a few days, when his mental consition improved and his mind regained its normal state.

CASE 19.

J. H. D., errand boy, age 14.

Admitted October 5th 1897. Initial rigor six days before. Discharged October 5th.

Treatment: Nil.

CASE 20.

J. N., fireman, age 31.

Admitted April 17th 1897. Patient was admitted in the evening. On admission he was very irritable and confused in his mind and as far as could be gathered he had been ill for about a week with diarrhoea. Sent in as a case of typhoid. There was some slight dulness at the right apex in front, reaching down to the nipple. Tubular breathing with fine crepitations. During the

evening of the 18th patient became restless and excited - he had not slept since admission. Pot. Bromide and Chloral aa 20 grains were given without effect; this was followed by a hypodermic injection of Morphia 1/6 gr. with the same result. During the early hours of the 19th., the mental excitement rose to almost maniacal frenzy, but the ordinary symptoms of delirium tremens were absent. Morphia gr. 1/6 seemed only to increase the excitement. Pot. Bromide and Chloral aa 40 grains had no effect, and the same result followed a second dose. Finally, about 5 a.m., patient was with considerable difficulty put into the tank with the water at 97°. He soon settled down and for a few minutes remained quiet. This temporary lull quickly passed off, and the excitement returned. Hyoscine Hypobromate gr.1/125 was given hypodermically and in about 10 minutes after the injection patient fell asleep and slept for three-and-a-half hours. During this time his temperature had varied between 103°and 104? Immersion in the tank brought his temperature down to below normal. Case developed a well marked apical pneumonia which cleared up. Crisis on the twelfth day. Urine: contained a trace of albu-

men, chlorides not diminished. Erhlich's reaction absent. Widal's serum reaction not obtained.

Treatment: Caffein 2 grains, Ammon. Carb. 10 grains four hourly, along with the sedatives as noted above. No stimulants.

The features of the case were the acute and violent delirium: The employment of the tank and Hyoscine in the treatment. Patient was discharged May 25th.

CASE 21.

C. P., foundry worker, age 15.

Admitted June23rd 1898, with a history of having on the day previously taken some over-proof spirit whether by accident or design was not known. He was in a dazed condition, could scarcely walk, staggering aimlessly about, pupils moderately dilated, breath smelling of over-proof spirit, knee-jerks diminished, talked with difficulty, and then only in monosyllables: pulse 100, weak; heart sounds clear, no bruit audible; lungs healthy; bowels constipated; urine albuminous. Calomel 3 grains was ordered as a preliminary measure. The next day he complained of frontal headache, had a short cough and looked flushed; no physical

signs to be observed in the lungs; temp. still raised. On the 25th signs of pneumonia at the apex anteriorly and posteriorly of the left lung were evident, and the slight sputum which he coughed up was rusty in colour and contained numerous pneumococci. Urine still albuminous, chlorides not diminished. Erhlich's reaction absent. Crisis occurred on the 27th day and he was discharged July 16th.

Treatment: Ammon. Carb. 6 grains, four hourly.
No stimulants.

The feature of the case was the previous history of alcoholic poisoning.

CASE 22.

J. H., seaman, age 63.

Admitted November 18th 1898. Sent in from S. "Glen-Cairn". History of four days illness and violent delirium. Right basal pneumonia. Died of cardiac failure November 19th. Had had no treatment prior to admission.

Treatment: Ammon. Carb. 10 grains, four hourly.
Oxygen inhalations; brandy 6 oz in 24 hours.

Was <u>in extremis</u> on admission.

CASE 23.

CASE 23.

F. S., dock labourer, age 65.

Admitted April 20th 1898. Condition bad; pulse rapid, weak; had pneumonia of the right lower lobe. Sputum very dark in colour, contained pneumococci. Strong alcoholic history; had been under treatment for four days outside. Patient died April 21st; temp. rising to 103 before death.

Treatment: Strychninae Nitrat. gr.$\frac{1}{32}$, four hourly; continuous inhalation of oxygen; brandy 6 oz in twenty-four hours.

Death from cardiac failure.

CASE 24.

A. J., dock labourer, age 48.

Admitted Aug. 10th 1898, at 3 a.m., in a collapsed condition with a history of having been immersed in the dock. Patient was pulseless, breathing with great difficulty and very much cyanosed. On examination of the heart, there was evidence of engorgement of the right side of the heart, dulness being found to the right of the sternum. On the following day, evidence of pneumonia at the right base was found; this cleared up and he was discharged on the 20th.

Treatment: Continuous inhalation of oxygen for six hours: Strychninae Nitrat. gr.1/32 four hourly for the first twenty-four hours, after that Ammon. Carb. 10 gr. four hourly.

Patient made a good recovery and on his being discharged the dulness to the right of the sternum had disappeared.

CASE 25.

J. P., dock labourer, age 40.

Admitted June 2nd 1898, from a common lodging house. His condition was extremely bad; pulse dicrotic and signs of circulatory embarrassment were well marked. Left apical pneumonia: sputum dark in colour, viscid in character, contained numerous pneumococci. Urine: albuminous, chlorides almost absent; Erhlich's reaction absent. Patient never picked up and died of cardiac failure June 4th.

Treatment: Ammon. Carb. 10 grains four hourly. Whiskey 8 oz in 24 hours.

CASE 26.

J. F., brewer's assistant, age 38.

Admitted May 22nd 1897, complaining of severe pain in the left side. Initial rigor two days pre-

viously. Said to have been a healthy man: history of acute rheumatism and drinks about half-a-pint of whiskey daily; pulse 120, regular, weak, and of low tension; heart sounds weak, no bruit audible. Double basal pneumonia; rusty sputum, containing pneumococci. On the next day, 23rd, pericardial friction heard at the base, pain severe relieved by the leeches applied. Died suddenly May 24th. Urine:- albuminous, chlorides not diminished; Erhlich's reaction absent.

Treatment: Ammon. Carb. 10 grains, four hourly.
Brandy 8 oz in 24 hours.

Post-mortem:- Pericarditis, pleurisy, and double pneumonia were found; also well marked myocarditis.

CASE 27.

J. R., seaman, age 68.

Admitted September 9th 1897 in a moribund condition. Right apical pneumonia, strong alcoholic history. Died September 10th.

Treatment: Ammon. Carb. 10 grains, four hourly.
Continuous inhalation of oxygen; brandy 8 oz in twenty-four hours.

Post-mortem:- Grey hepatisation of the two upper lobes of the right lung; heart dilated and fatty.

CASE 28.

CASE 28.

W. K., police-constable, age 39.

Admitted October 13th 1897. Came in suffering from acute gastric catarrh and signs of commencing consolidation at the left apex; short cough with rusty sputum containing pneumococci. Examination of the other systems showed them to be healthy. Initial rigor three days before admission. Strong alcoholic history. He progressed fairly well until the 15th when he had an attack of cardiac failure and he became very cyanosed; pulse weak and irregular. Strychnin. Nitrat. gr.1/32 hypodermically and inhalations of oxygen for three hours brought him round. The following night he got wildly delirious, sat up in bed and dropped back dead. Urine:- contained albumen, chlorides diminished and on the day preceding his death Erhlich's reaction was present.

Treatment: Ammon. Carb. 10 grains, four hourly; Brandy 6 oz., champagne 8 oz in 24 hours.

No post-mortem allowed.

CASE 29.

E. K., chamber-maid, age 26.

Admitted November 27th 1897. Initial rigor five

days before. She had previously been subject to bronchitic attacks. On admission she had dulness at both bases, with signs of effusion at the left base, which was corroborated by exploratory puncture. The sputum was viscid, rusty and contained pneumococci. Patient never rallied and died on the seventh day of cardiac failure.

Treatment: Ammon. Carb. 10 grains four hourly - increased to three hourly; brandy 6 oz. Tepid sponging for the temperature.

CASE 30.

P. B., dock labourer, age 41.

Admitted December 21 1898. Initial rigor five days previously. On examination:- consolidation of the right base: sputum rusty muco-purulent, contained pneumococci and streptococci: breath fetid. Heart sounds almost inaudible; pulse weak, rapid and irregular 146; resp. 36. Patient became delirious and gradually sank and died December 31st. Chlorides were absent during the heighth of the delirium.

Treatment: Ammom. Carb. 10 grains and Tinct. Digitalis 15 m., four hourly; brandy 6 oz, champagne 10 oz in the 24 hours.

Case had had pneumonia twice before, this being his third attack.

CASE 31.

E. G., plasterer, age 43.

Admitted May 14th 1898 in a semi-conscious condition, breathing stertorously; some paresis of the right arm: pupils medium and equal: Urine drawn off with a catheter was found to contain a quantity of albumen, measuring a 1/4 in the albuminometer. On the 15th temp. went up and on the next day consolidation of the right base was found. Patient died on May 17th.

Treatment: was useless. Patient was unconscious from the hour of admission.

Post-mortem:- Twelve hours after death. Brain showed congestion of the pia-arachnoid, more especially over the left tempero-sphenoidal region. The arteries at the base of the brain showed well advanced atheromatous change. On section two haemorrhages were found, one in the left tempero-sphenoidal lobe, one in the left side of the pons; both were about the size of a walnut. Heart was hypertrophied especially the left venticle, the organ weighing 17 oz. Right lung showed red hepatization of the two lower lobes; on further

examination of the congested area, pneumococci were found to be present. Left lung normal. Both kidneys showed microscopically interstitial changes fairly well advanced.

CASE 32.

B. R., police-constable, age 37.

Admitted January 7th 1898, complaining of pain in the right side and cough: There was found consolidation of the right lung from the angle of the scapula downwards: Tubular breathing: sputum tenacious and rusty contained pneumococci. Cardiac apex beat two inches, external to the left nipple, and almost inaudible to auscultation: Auscultation of the mitral area showed the presence of a systolic murmur; pulse rapid weak and easily compressed. Patient progressed very well until the 10th when signs of cardiac failure, i.e., cyanosis, increased frequency of the pulse becoming evident, cardiac failure more pronounced on the 12th, patient died. Temp. going up to 105 before death. Urine, contained albumen, and for three days before death chlorides were absent. Ehrlich's reaction was present.

Treatment: Tinct. Digitalis 15 m., every four hours; brandy 8 oz. After the even-

ing of the 12th continuous inhalation of oxygen: Strychninae Nitrat. gr. 1/32, four hourly. Tepid sponging for the temperature.

This case had a strong alcoholic history and was complicated by mitral incompetence.

CASE 33.

T. W., seaman, age 63.

Admitted April 21st 1898. Initial rigor two days before; but history was vague, as he had been engaged in a drinking bout for about a week. He had all the physical signs of a left basal pneumonia: pericardial friction heard at the base of the cardiac area. Patient also showed signs of incipient delirium tremens, which developed two days after admission. Patient's condition from the hour of admission was critical and latterly, hopeless, being wildly delirious for the last three days of his life. He died on the 25th, the seventh day of illness. Urine: albuminous, chlorides diminished on the sixth and seventh day. Ehrlich's reaction not present. Pneumococci found very abundantly in the sputum.

Treatment: Ammon. Carb. 10 grains; Tinct. Digitalis 15 m., four hourly. Brandy

6 oz, Champagne 20 oz, in the 24 hours.

Tepid sponging for the temperature.

Post-mortem: Some traces of recent pericarditis were found, there being about 6 oz of serum in the pericardial sac; some recent pleurisy on the posterior surface of the right lung: consolidation of the lower lobe of the left lung showing red & grey hepatization.

CASE 34.

A. G., hawker, age 29.

Admitted July 10th 1897, suffering from the effect of immersion in the dock: was brought in in a semi-conscious collapsed condition: signs of dilatation of the right side of the heart; developed pneumonia of the left base: died of cardiac failure on the 17th.

Treatment: Strychnin. Nitrat. gr. 1/32, and

Ammon. Carb. 10 grains four hourly.

Brandy 6 oz, in the 24 hours.

Patient was handicapped by a circulatory condition and never rallied.

CASE 35.

J. F., dock labourer, age 20.

Admitted December 22nd 1898, on the recommendation of an outside practitioner, very much cyanosed,

veins of the neck distended, very much like a patient completely under the influence of ether and on percussing the cardiac area dulness was found to the right of the sternum. Consolidation of both bases; pulse 126; resp., 56. Patient died of cardiac failure two hours after admission. Treatment: Attempts were made to relieve the cyanosis by blood letting and inhalation of oxygen, but without success.

CASE 36.

S. C., housewife, age 22.

Admitted January 9th 1898. She had a previous history of ill health; but no history of an initial rigor could be elicited. On admission temp. was raised and there was a slight patch of dulness below the angle of the right scapula; fine crepitations on auscultation. On the 13th commencing consolidation of the left apex, and the sputum semi-purulent and rusty in character contained pneumococci and streptococci. Urine: albuminous gave Ehrlich's reaction, chlorides were normal. Patient's condition all the time was critical and she died suddenly of cardiac failure on the 21st. Towards the end of her illness the sputum was foetid in character.

Treatment: Tinct. Digitalis 8 m. Strychnin. Nitrat. gr. 1/32 four hourly. Inhalations of Creasote at frequent intervals.

Post-mortem: On opening the throx recent pleuretic adhesions were found at the apex and base of the right lung, which weighed 1lb 14 1/2 oz; upper lobe was solid and in a state of red hepatization. Middle and lower lobes were in a state of acute congestion. Left lung solid, weighed 3lbs 0 1/2oz; upper lobe showed red hepatization as did also the lower lobe, except at the extreme base, which was crepitant and in a state of acute congestion. Heart: healthy.

CASE 37.

B. C., apprentice, age 16.

Admitted April 12th 1898. Initial rigor two days before: patient a thin ill-nourished lad. On examination had impaired resonance over the right apex, friction and crepitations on Osculta-tion: sputum rusty and tenacious contained pneumococci in large numbers. Pulse 120; resp., 54. Patient also complained of abdominal pain, and had diarrhoea with frequent stools, four to seven in the 24 hours. Liquid containing shreds of mu-

cous, undigested milk, green in colour and were very offensive. Patient developed a right apical pneumonia with attendant pleurisy and had a very severe attack; crisis on the 18th and made a good recovery. Unrine:- faint trace of albumen, no diminution of chlorides. Ehrlich's reaction present.

Treatment: Ammon. Carb. 8 grains, four hourly; champagne 8 oz in 24 hours. Mist. Cretae. 1/2 to 1 oz for the diarrhoea when required.

In this case pneumonia was complicated by acute enteritis.

CASE 38.

M. H., housewife, age 28.

Admitted June 12th 1897. History was that she had gone out too soon after her confinement, and caught a chill; confinement had occurred a fortnight previous to admission. Tongue clean and moist, skin, hot and dry; dry cough, expectorating with difficulty, some muco-purulent, rusty in colour, containing pneumococci and streptococci; no tubercle bacilli were found. There was dulness over the front of the left chest and posteriorly down to the angle of the left scapula. tubu-

lar breathing and a few sibilant rhonchi heard on auscultation. Rhonchi also heard over the right lung. There was a slight vaginal discharge very foetid in character. Patient was put under treatment and kept in a cold-pack to bring down the temperature; on the 17th the pneumonic process had extended to the right lung and there were scattered pneumonic areas over the right lung; diarrhoea was very troublesome: loose offensive stools. Urine: showed only albumen, which was present in fair quantities.

Treatment: Ammon. Carb. 8 grains, four hourly. Brandy 8 oz in 24 hours. Vaginal douching.

This was a case occurring during the purperium, probably of septic origin.

CASE 39.

A. B., house wife, age 24.

Admitted September 23rd 1897. Initial rigor three days previously. Patient was very ill and collapsed on admission, and looked as if she would not live many hours. Right apex showed impaired resonance anteriorly and fine crepitations; there was pain in the side which was treated by iced compresses. Her temperature was 103.8 She was

put on Strychnin. Nitrat. gr. 1/32, hypodermically ecery four hours, brandy 8 oz in 24 hours. Gradually the whole of the upper lobe of the left lung became consolidated. On the 2nd October, signs of pleurisy with effusion were present at the left base, and dulness gradually extended till it reached the angle of the scapula: Presence of fluid was determined by diagnostic puncture. At this time, patient's condition was very serious indeed, and her life was despaired of. On the 10th patient aborted, her uterine cast and foetus about 2 1/2 months were expelled. After this, patient began slowly to improve; physical signs to disappear and patient was discharged November 20th.

Treatment: Ammon. Carb. 6 grains, Tinct. Digitalis 10 m., four hourly. Brandy 8 oz Champagne 8 oz; inhalations of oxygen for periods of four hours twice daily.

Case was a very critical one, complicated by pleurisy with effusion and abortion.

CASE 40.

M. F., dock labourer, age 47.

Admitted May 2nd 1898. Sent in undiagnosed.

On admission, dulness at right apex anteriorly, with crepitations, posteriorly, dulness absolute

extending down to an inch below the spine of the scapula; tubular breathing: pulse dicrotic. The next day the pneumonic process had spread and dulness was apparent down to the base. Tubular breathing and crepitations onauscultation; also crepitations in right axilla. He became delirious and cardiac failure was imminent. On May 5th he lay in a low muttering delirium resembling a case of typhus, and for this reason he was isolated. From this time onwards, he became acutely delirious and he died on the 7th. Temp., 106.6. Progressive pulse tracings show gradual failure of the heart.

Treatment: Ammon. Carb. 10 grains, four hourly, Champagne 20 oz, Brandy 10 oz. Cold sponging for the temperature.

This case was complicated by delirium and hyperrexia. The urine in this case showed diminished chlorides on the day prior to his death; it was albuminous and Ehrlich's reaction was well marked.

CASE 41.

W. R., veterinary-surgeon, age 39.

Admitted May 14th 1898. Sent in by a private practioner as a case of pneumonia. Patient said he had been feeling unwell for some time past,

his past history having been one of hard living and excessive indulgence in alcohol. He complained of pain in his right side. On examination, there was found moderate dulness of both bases: heart healthy; pulse, fair; put on Ammon. Carb. 10 grains four hourly. On the following day i.e., May 15th, the dulness at the right base was more marked, & there was some dulness at the right apex with tubular breathing. On the 16th he felt very well- the dulness at the right apex had almost disappeared and breath sounds were almost normal. The little sputum which he coughed up contained pneumococci and streptococci, no tubercle bacilli: pulse showed a normal pulse tracing. He was progressing very favourably, some slight hoarseness and an irritating cough being the only things he complained of; larynx on examination showing some slight congestion of the chords, and some slight deficiency in movement of the right one. On the 26th his temperature went up again, though his lungs by this time had cleared up, prolonged expiration on auscultation being the only symptoms noticeable, a slight deficiency of the respiratory murmur over the right lung was noticeable and some dulness in the right inter-scapular space

opposite the spine of the scapula. On June 3rd the hoarse character of his voice grew more evident and he became almost aphonic; his cough being very frequent and resultless. Patient also had paroxysms of dyspnoeia, which were improved by inhalations of Amyl. Nitrate. On June 4th patient complained of pain just at the root of the neck on the right side; there was some fulness to be noticed in this region and also some dilatation of the veins on the right side of the neck. Patient continued to complain of pain and tenderness at the root of the neck, and the attacks of dyspnoeia now becoming more frequent and distressing were treated by hypodermic injections of Morphia gr. 1/6, and Atropin. Sulph. gr.1/120. On the 9th, the larynx was examined again, the congestion of the chords was very evident and the right one scarcely moved at all, examination being under the circumstances necessarily brief and difficult. Patient no longer got any relief from Morphia and was treated by the combined inhalation of oxygen and chloroform. Later on in the evening, he got worse, tracheotomy was performed and a catheter was passed down the bronchus (right) but patient never rallied and died early on the morning of the 10th.

Post-mortem: Owing to some difficulty with the friends, who refused permission, an autopsy was only obtained on a Coroner's order, and not until the 14th, by which time decomposition was fairly advanced. The Thoracic Viscera were removed "en masse"; while doing so an abscess cavity lying behind the right sterno-clavicular joint was opened into and some pus escaped. There were recent adhesions in both pleural cavities, more especially the right one, and both lungs showed signs of old standing bronchitis; but there was no part of the lungs which might have been described as the resolution stage of pneumonia. The tissues on the right side were matted together and an abscess was found, extending down the right side of the trachea, and terminating above and behind the right bronchus; Upwards, it extended by the side of and behind the trachea as high as the sixth ring of the trachea. The tissues were very much matted together. In the root of the neck, the vessels lay external to and in front of the abscess. About the sixth ring of the trachea, the abscess partially surrounded it, the right recurrent laryngeal nerve being embedded in dense inflammatory tissue. On opening the trachea, the walls were

found to be congested as also were the vocal chords and about the seventh ring posteriorly, there was a small ulcerating area of about the size of sixpence where the abscess had just been on the point rupturing. The right bronchus was flattened antro-posteriorly. The abscess contained thick pus and fragments of broken down gland tissue were found near the right bronchus. As decomposition was far advanced, the pus was not examined bacteriologically.

Heart:- showed slight fatty change and dilatation of the right side; no valvular mischief.

Liver:- slight fatty and cirrhotic change.

Kidneys:- showed some congestion.

Case was one complicated by suppuration of the bronchial glands.

CASE 42.

H. C., joiner, age 18.

Admitted May 13th 1898. Sent in as a case of enteric; had been ill for fourteen days though Widal's reaction was not obtained, he showed all the classical symptoms of the disease. Urine, showed no diminution of chlorides, contained albumen, and Ehrlich's reaction was very well marked. Consolidation of both bases, tubular breathing

on auscultation. Temp. 104°, resp., 40, pulse 128. Despite cold sponging and iced-compresses, temp. still continued to rise, so on the 13th he was put into the tank, the water being at a temp. of 97°. The effect was instantaneous. Temp. came down from 104° to 100.5, pulse 128 to 110, resp, 40 to 28. He was kept in the tank till his temperature was normal: He slept better, his tongue, previously dry, became moist. He improved rapidly and was discharged July 12th.

This case shows marked improvement by treatment of continuous immersion.

CASE 43.

D. J., stoker, age 31.

Admitted July 25th 1898, complained of pain in his side and cough. History:- Ten days previous to his admission he received a blow from the handle of a winch inflicting a deep wound on the nose; five days after that, he was suddenly seized with a sharp pain in the right side.

On admission, patient looked very ill. Temp.101; pulse 112; resp., 28. He had a septic wound, extending from above the left eye to the root of the nose down to the bone, containing pus, which was partially pent up, and which on examination showed

streptococci and staphylococci. This wound was opened up and drained. He had dulness over the base of his right lung, loss of vocal resonance, & fremitus crepitations and tubular breathing on auscultation; crepitations and tubular breathing were also heard over the base of his left lung. Sputum, rusty, tenacious and scanty in amount contained numbrous pneumococci and streptococci. On the 27th, the right base was explored in the scapular line in the fifth inter-costal space, and about 3 1/2 oz of semi-purulent fluid were withdrawn. Some agar tubes were inoculated with the fluid thus obtained and a typical culture of the bacillus coli communis was obtained. On the 28th he was aspirated again, 13 1/2 oz of fluid being withdrawn. On the 29th the dulness over the right lung was less marked, extending up to the seventh rib posteriorly, friction being heard above that area. On the 30th friction sounds were heard all over the right lung. On August 2nd friction was heard over the base of the left lung. On Aug. 5th dulness varying with the position of the patient was still present over the right lung, temp. 102, and it was decided to drain the pleura. This was accordingly done, and 4 1/2 oz of pus were evacu-

ated, temp. falling to 99. He continued to progress fairly well, breath sounds on the right side being heard as far down as the 9th rib in the scapular line. Below this, the percussion note was impaired, and no breath sounds were audible; signs of effusion on the left side beginning to disappear. On the 22nd, breath sounds were heard as far down as the 10th rib in the scapular line, below this a few crepitations. Sept. 13th., patient still continued to do well; wound discharging freely: cough, very troublesome and resultless: sputum, muco-purulent in character, small in amount, containing pneumococci and streptococci: some dulness at the base of the right lung and at the inner border of the scapula opposite the third dorsal vertebra and there was a small localised patch of dulness, some crepitations and some deficiency of breath sounds entering the right lung. Temp. was elevated. On the 18th patient had a tremendous fit of coughing and expectorated a large amount of purulent material, his sputum cup requiring to be emptied thrice in twenty-four hours. After this his temperature came down and patient progressed rapidly; wound healed on the 30th and patient was discharged October 31st. Lungs, nearly cleared up,

some dulness over the base of the right lung still remaining.

This case was one of pneumonia and empyema, complicated also by suppuration of the bronchial glands terminating favourably.

Treatment:- Ammon. Carb. 5 grains, four hourly, for the first few days; Brandy 4oz.
After the operation, it was mainly tonic combined with generous dietary.

CASE 44.

T. J., porter, 37.

Admitted February 3rd 1899. History was that he had been nursing his brother, who died of pneumonia a week prior to his being admitted. Initial rigor four days previously. Patient had suffered for many years past from recurrent attacks of bronchitis and had well-marked signs of emphysema, also he had a strong alcoholic history. Well marked consolidation of left apex, tubular breathing and crepitations; sputum:- rusty, containing pneumococci: sybilant rhonchi were heard all over the rest of the chest. Temp. 101.2; pulse 100; resp., 36. Patient did very well. Crisis 8th day. Urine:- albuminous, chlorides diminished on seventh day and remained so for three days after

the crisis. Discharged March 1st.

Treatment:- Ammon. Carb. 10 grains, four hourly, and later Tinct. Digitalis 15 m. four hourly; Brandy 6 oz. At one time patient was rather cyanosed, and the emphysematous condition of his lungs aided this condition. He was relieved greatly by dry-cupping.

A fairly severe attack of apical pneumonia, with bronchitis, and a history of exposure to infection.

CASE 45.

G. M., ship's officer, age 28.

Admitted February 13th 1899, from R. M. S. "Aurania". History of influenza and exposure to cold. Initial rigor, five days previously. Consolidatinn of lower lobe of left lung. Sputum contained pneumococci. Crisis on the 14th. On the evening of the same day his temperature rose again and there was found acute inflammation and enlargement of the right tonsil; some tenderness behind the angle of the jaw. Temperature came down on the 16th; had a rapid convalescence and was discharged March 1st.

Treatment:- Ammon. Carb. 10 grains, four hourly, no stimulants. Tonsil sprayed with 1 in 6000 Corrosive Sublimate.

Urine contained no albumen: chlorides diminished on the 7th day. Ehrlich's reaction absent.

A simple basal pneumonia, complicated with tonsillitis.

CASE 46.

A. H., boatman, age 21.

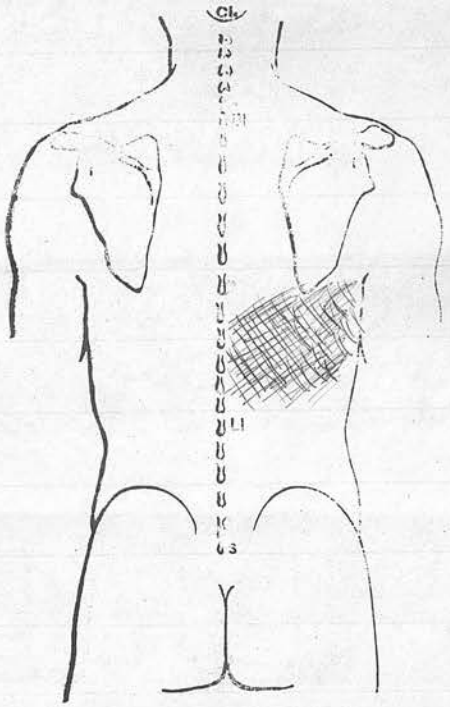
Admitted February 21st 1899, complaining of feeling "ill" and pain in the abdomen. He had a short cough. Temp. 104; pulse 120; resp., 40. On examination of the lungs nothing could be found. He also had a purulent conjunctivitis affecting both eyes. History was that his illness started with vomiting and that he had been unwell from that date. On the 22nd some dulness developed over the right scapular region and patient's condition became a great deal worse. He coughed with difficulty some viscid rusty sputum, which on examination was found to contain pneumococci. The pus from the conjunctiva was also examined and found to contain numbers of diplococci, which corresponded in cultivation characters etc to the organism of Fränkel. The dulness spread and gradually involved the whole of the right apex. Patient, who was a small ill-nourished man, his weight only being 5 st. 10^{lbs} had a very severe attack but made a

good recovery. Urine, during the disease, showed the presence of albumen in considerable quantity, chlorides almost absent. Ehrlich's reaction absent. Pulse showed well-marked dicrotism and temperature also displayed a pseudo-crisis.

Treatment:-Ammon.Carb. 10 grains, Tinct. Digitalis 15 m., four hourly. No stimulants.

Case was complicated or attended by a conjunctivitis which seemed to be of pneumococcal origin.

CASE 1.



Name Richard Nicholson Age 42 Disease Result

Time.	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Bowels.																																				
Urine.																																				

Temperature (Fahrenheit): 107° 106° 105° 104° 103° 102° 101° 100° 99° (Normal Temperature of body.) 98° 97°

Temperature (Centigrade): 42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease								
Pulse	M		128	128	80	90	78	
	E	108	136	120	104	80	74	
Resp.	M		56	44	36	24	26	
	E	44	56	48	40	28	30	
Date.		14	15	16	17	18	19	20

Entered at Stationers Hall. April

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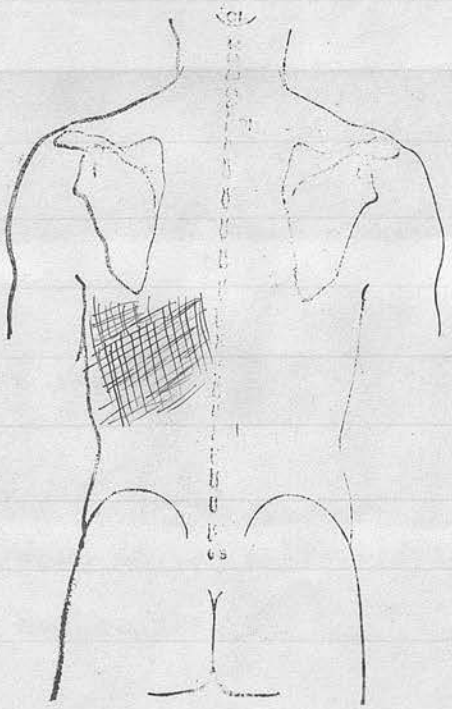
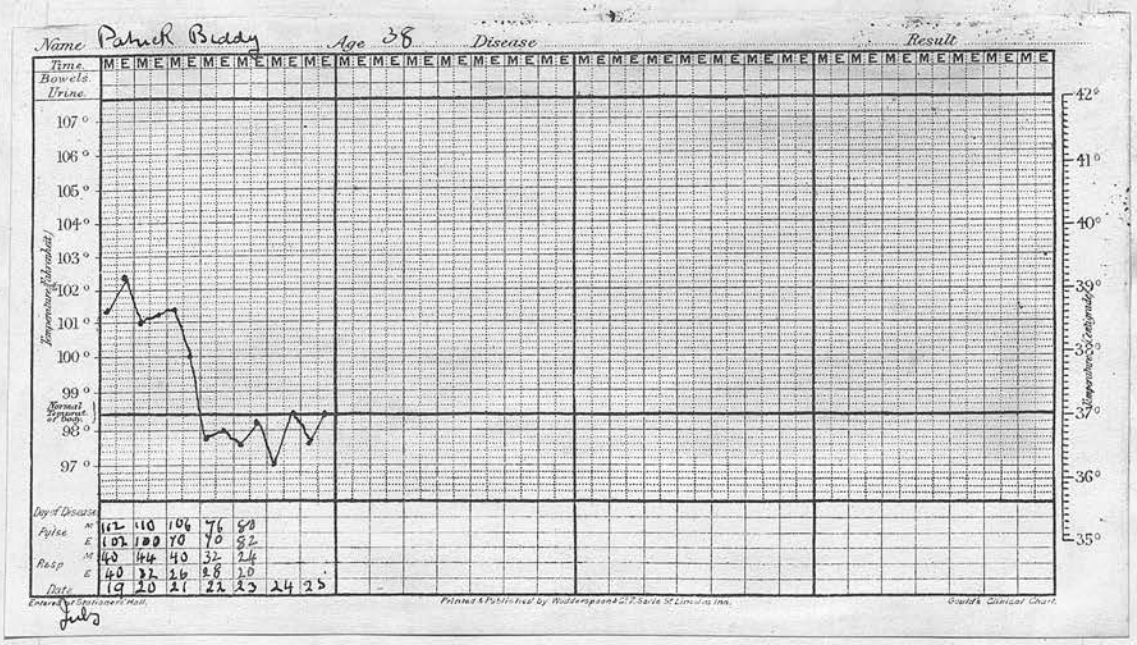
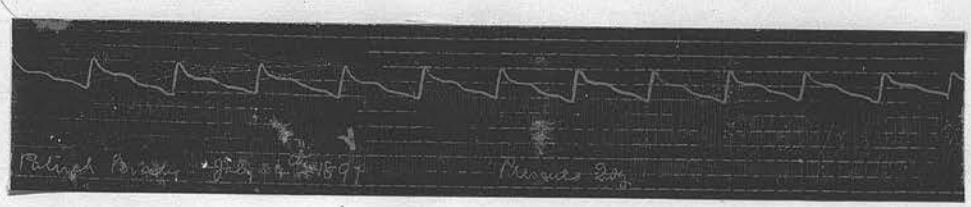
In this case the pulse has maintained its normal characters.

CASE 2.

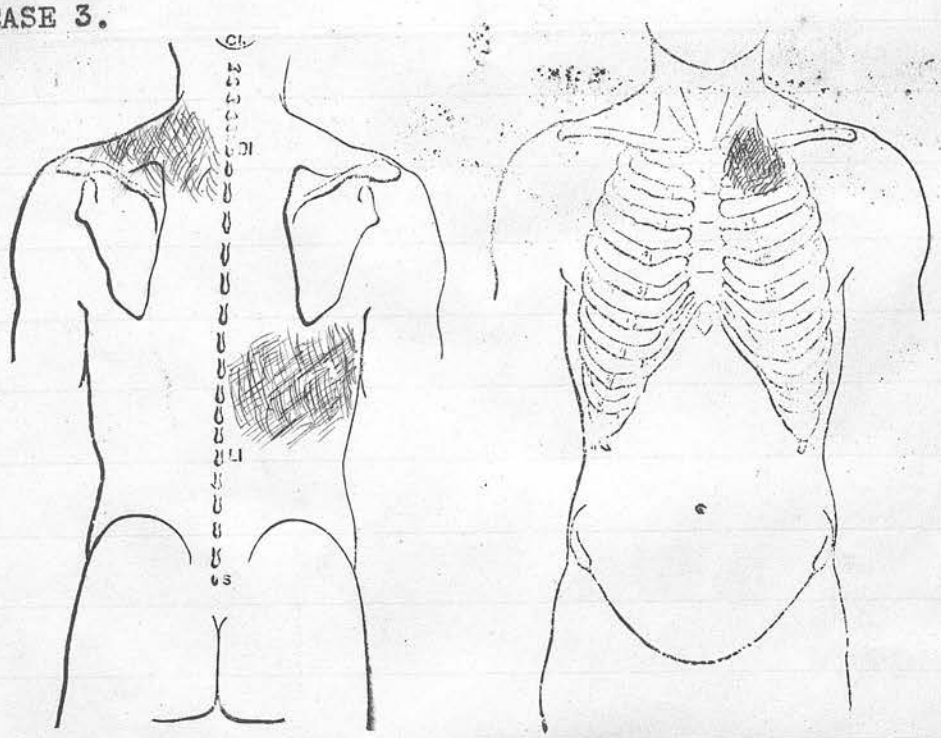


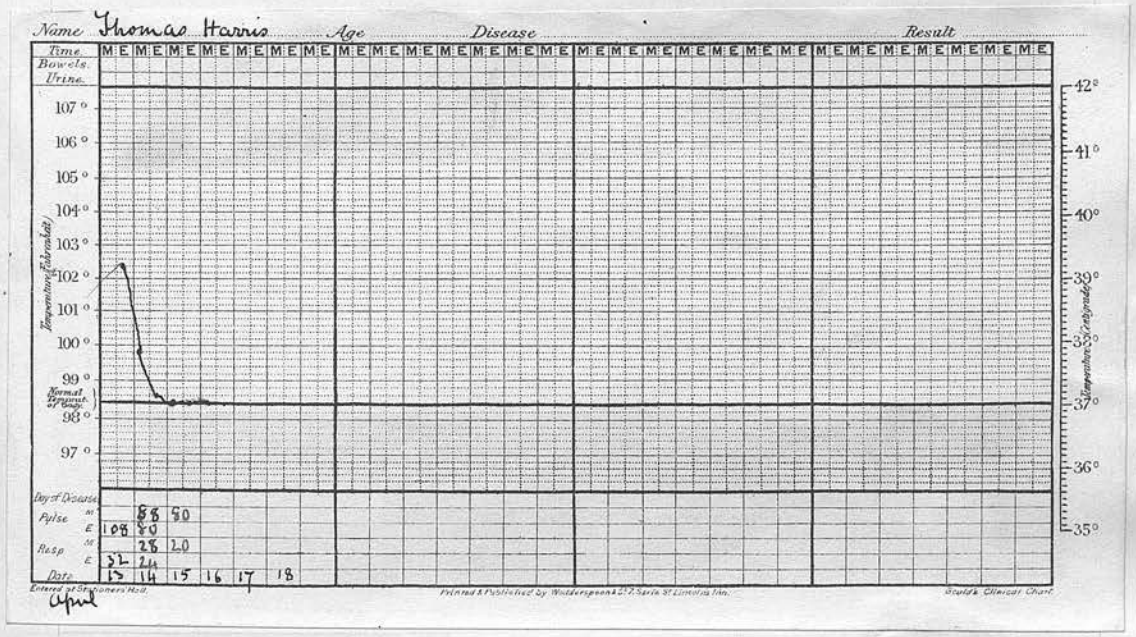




The difference in the pulse before and after the crisis is noticeable.

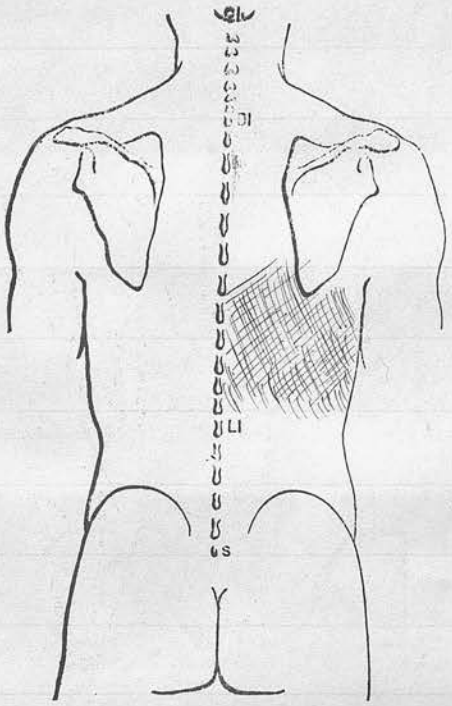
CASE 3.





Pulse showed no special character.

CASE 4.



Name James Peterson Age Disease Result

Time
Bowels
Urine

Day of Disease		5	6	7	8	9	10	11	12	13
Pulse	M	120	100	120	112	108	104	100	88	84
	E	104	112	116	120	120	112	96	84	86
Resp	M	40	32	32	36	36	32	28	28	20
	E	26	36	36	36	40	28	30	26	24

Entered Apl Strangers Hos.

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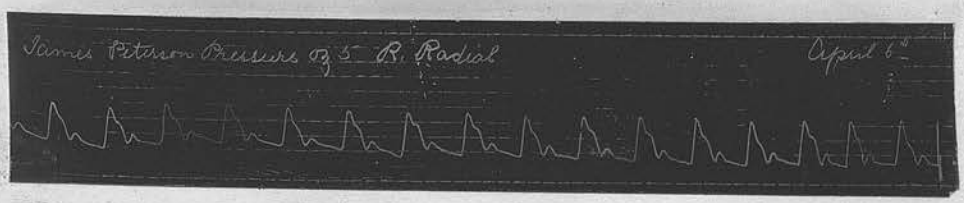
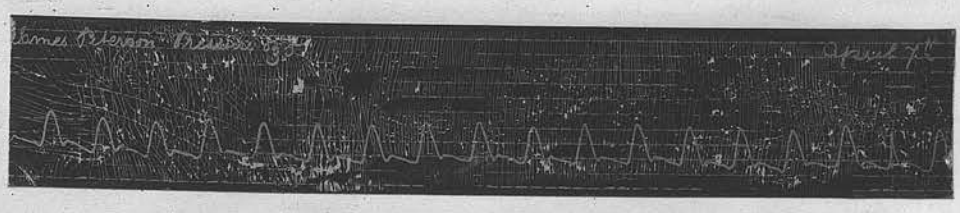
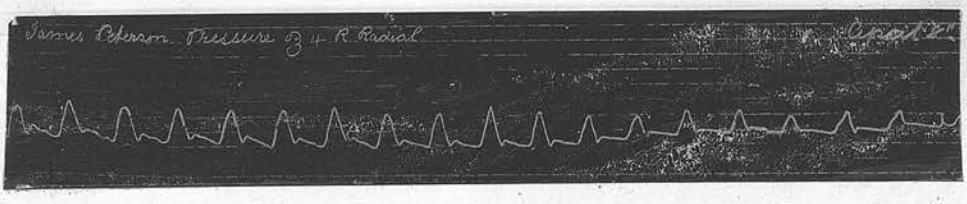
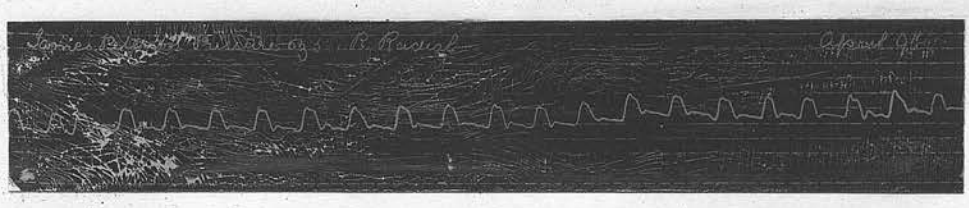
Gould's Clinical Chart

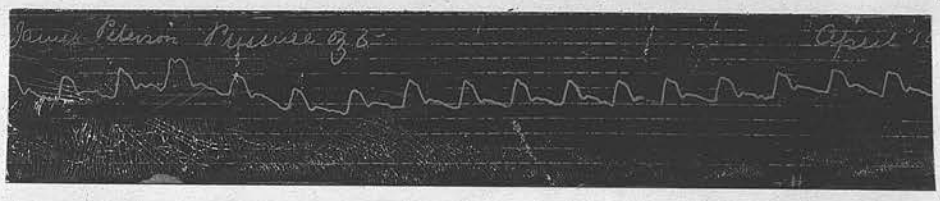


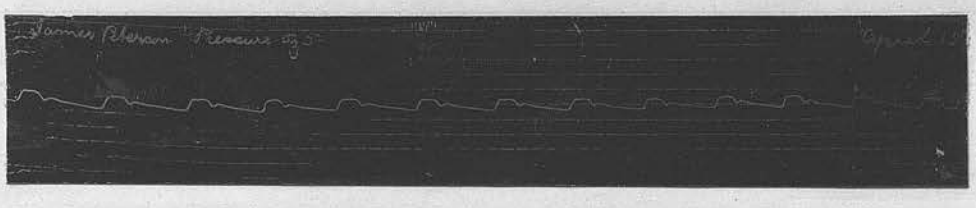


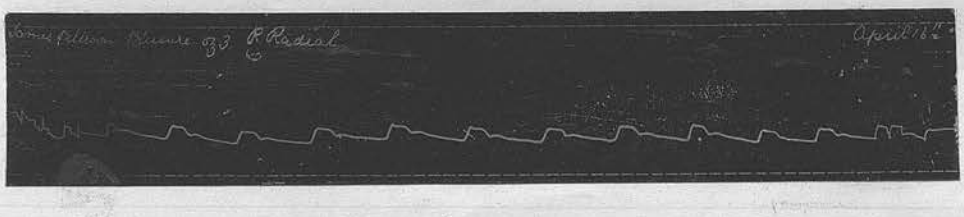

James Peterson Pressure 23 4 R Radial
April 2


James Peterson Pressure 23 5 R Radial
April 9


James Peterson Pressure 23 6
April 16

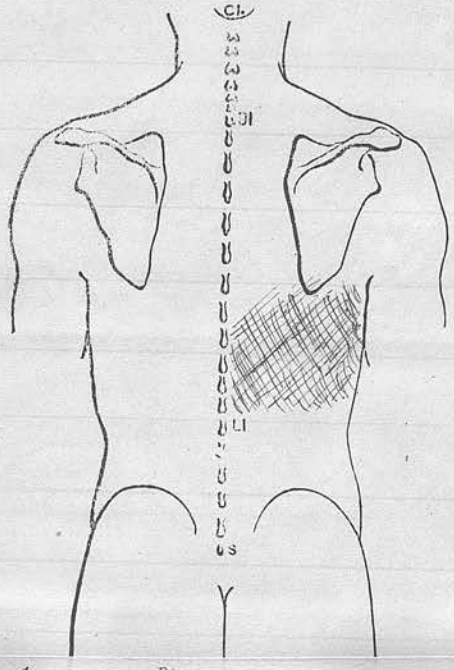

James Peterson Pressure 23 7
April 23

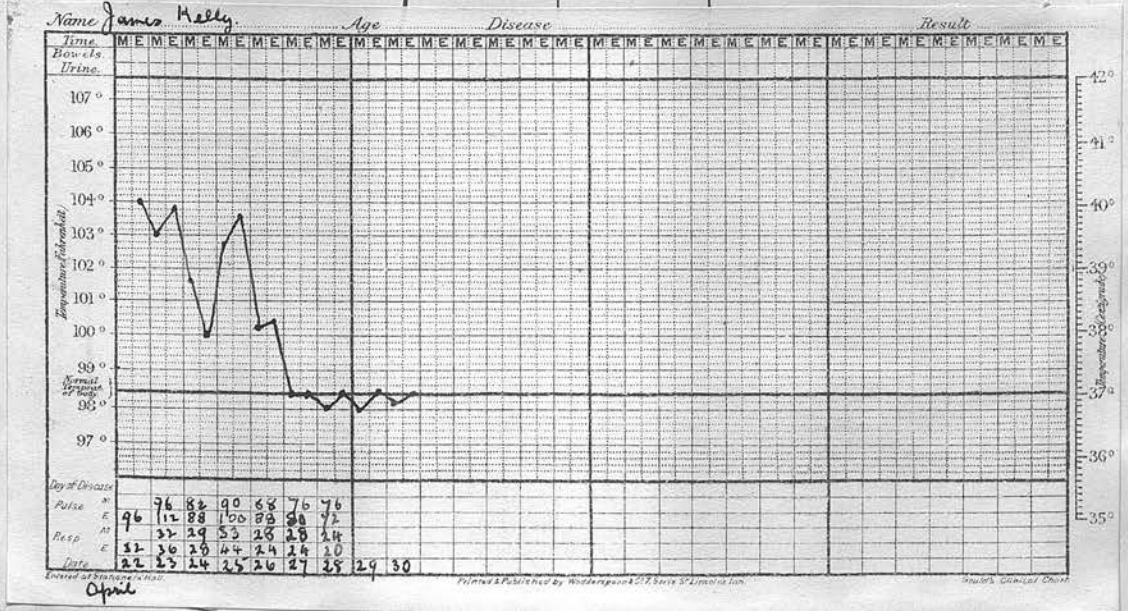

James Peterson Pressure 23 8
April 30

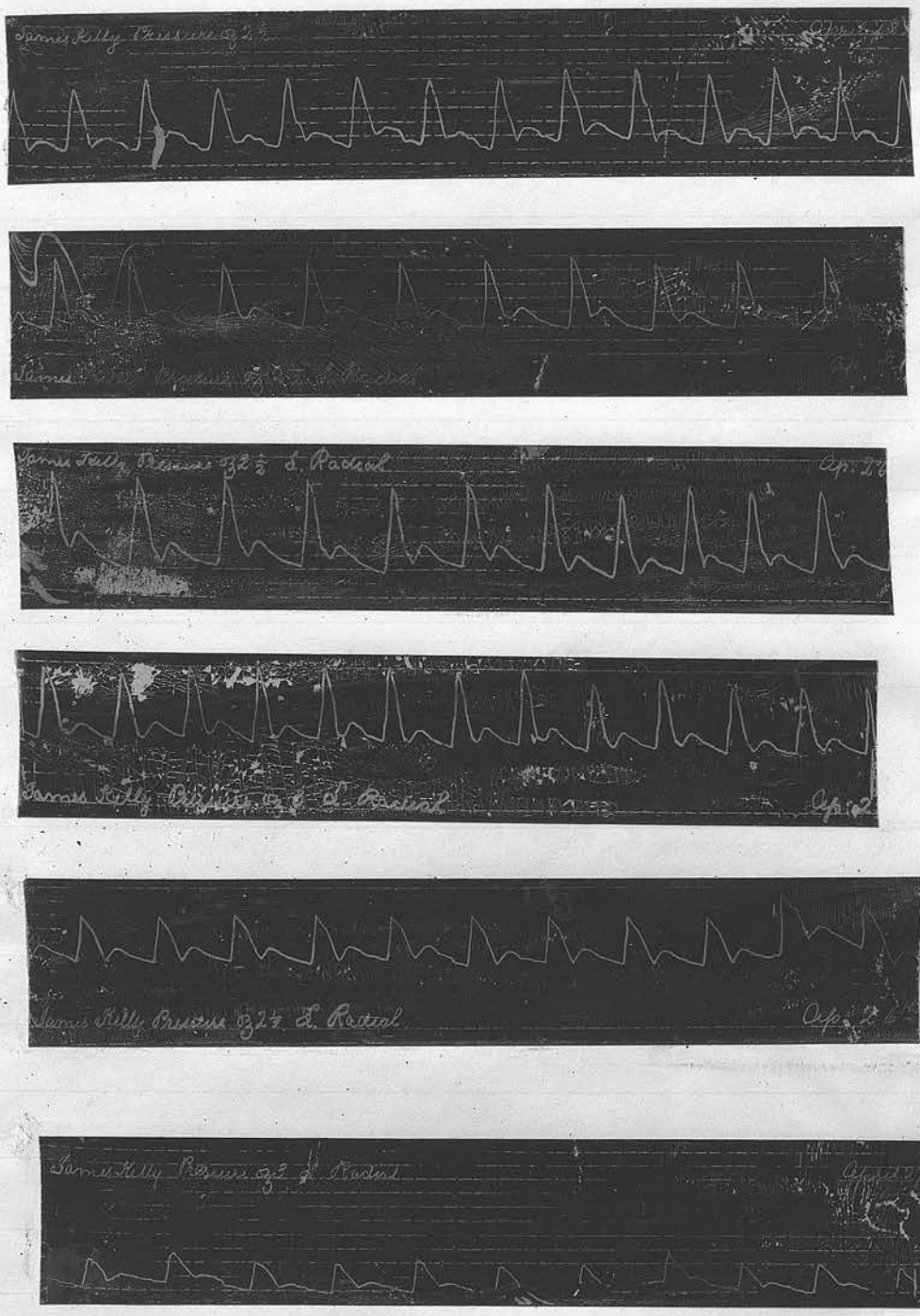

James Peterson Pressure 23 9 R Radial
April 30

These are the charts and tracings of a case of aortic stenosis during the course of an attack of pneumonia - showing its gradual progress till it regains the square-top character.

CASE 5.

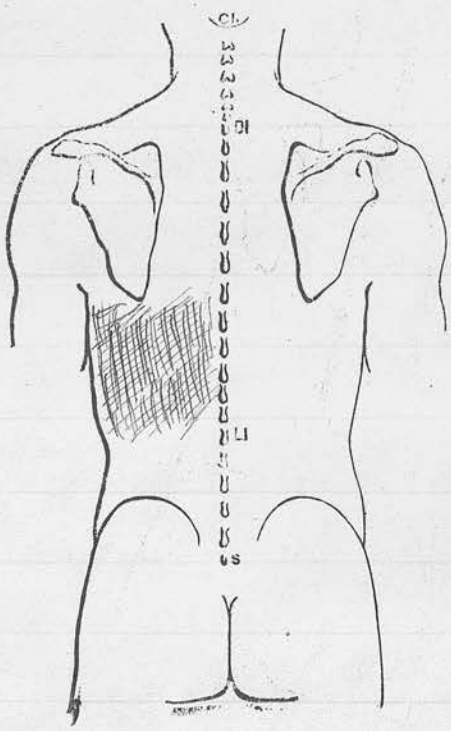


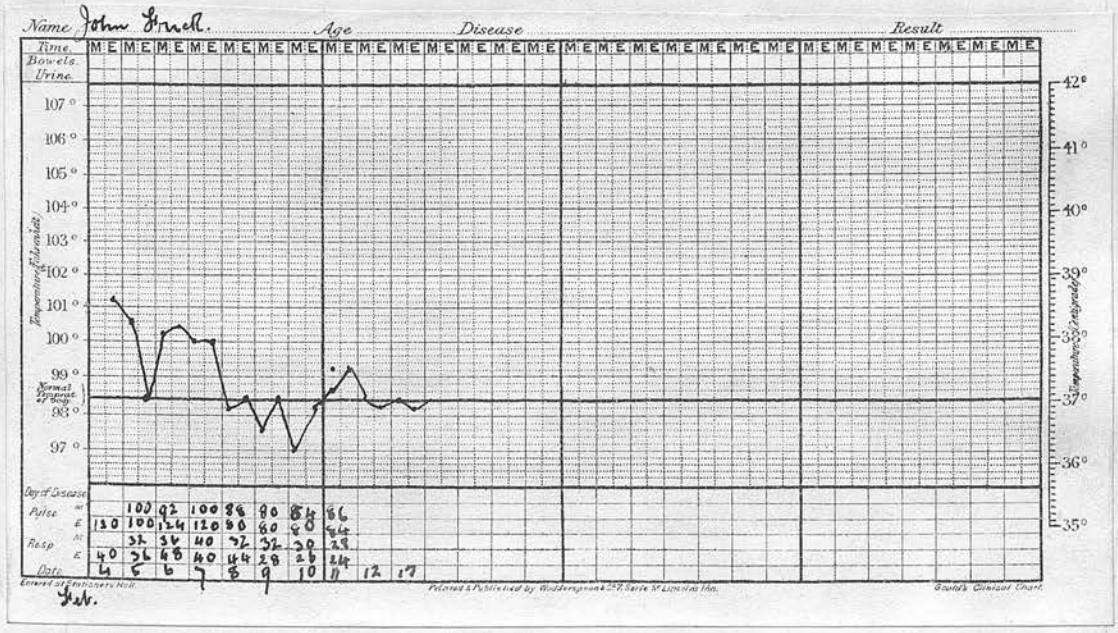




Consecutive tracings in a simple case of pneumonia showing dicrotism.

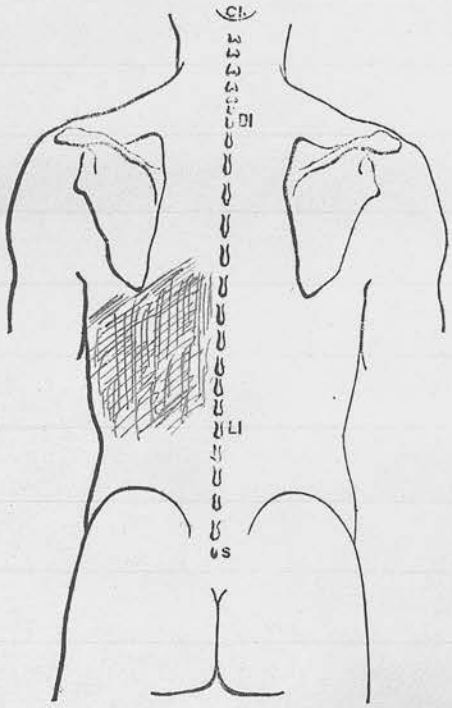
CASE 6.

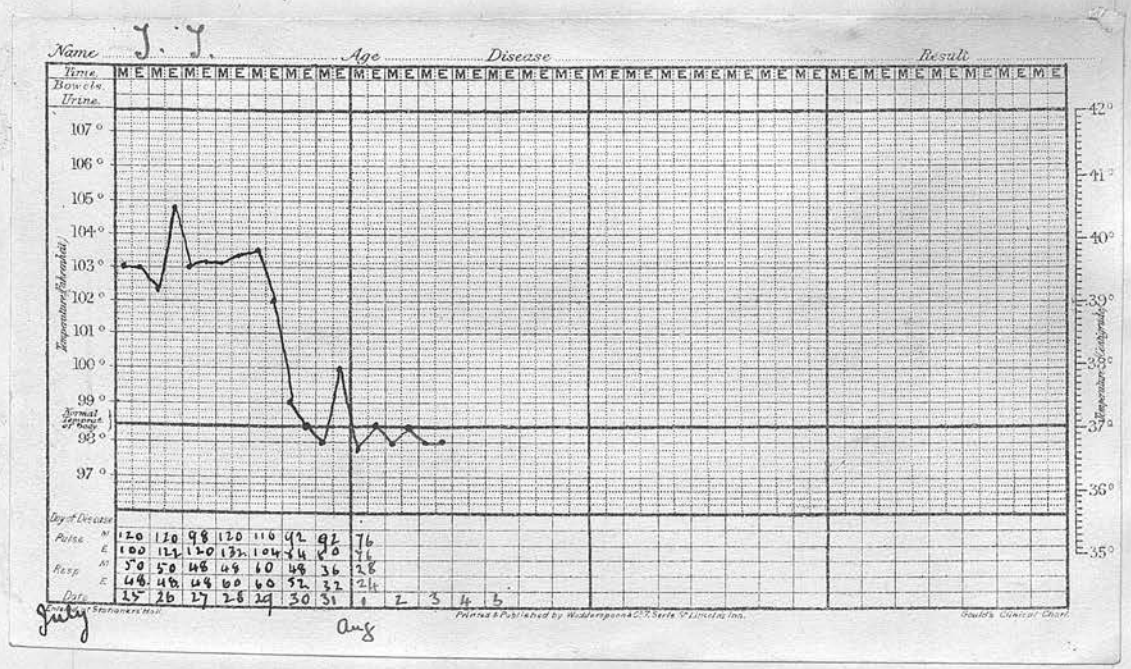


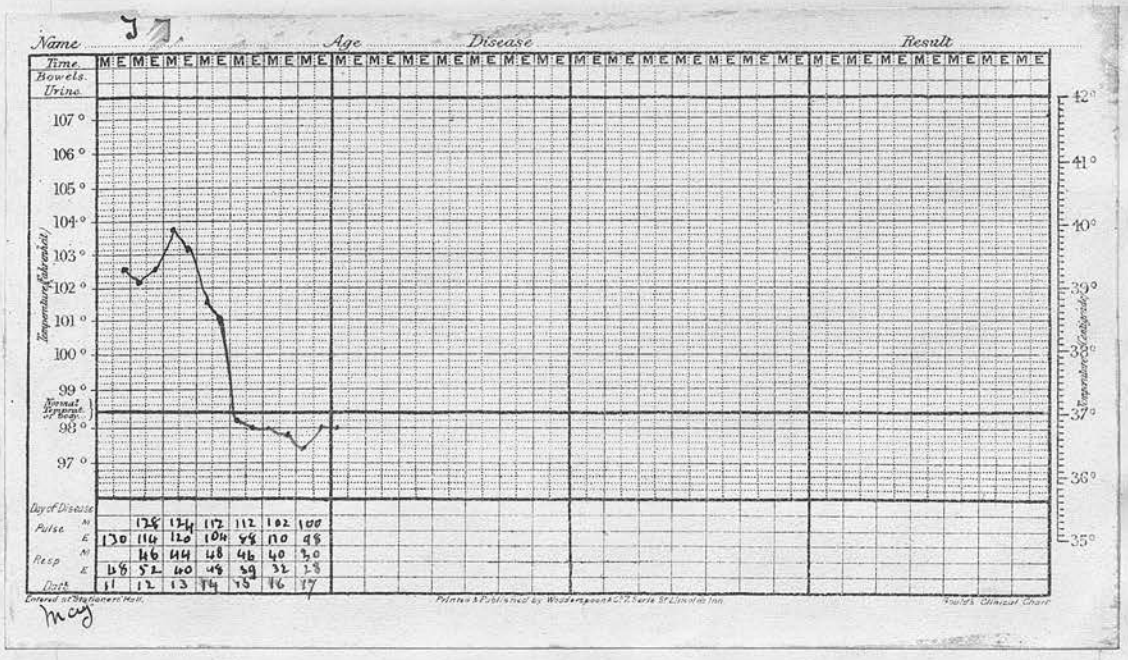


Pulse showed no particular characters.

CASE 7.

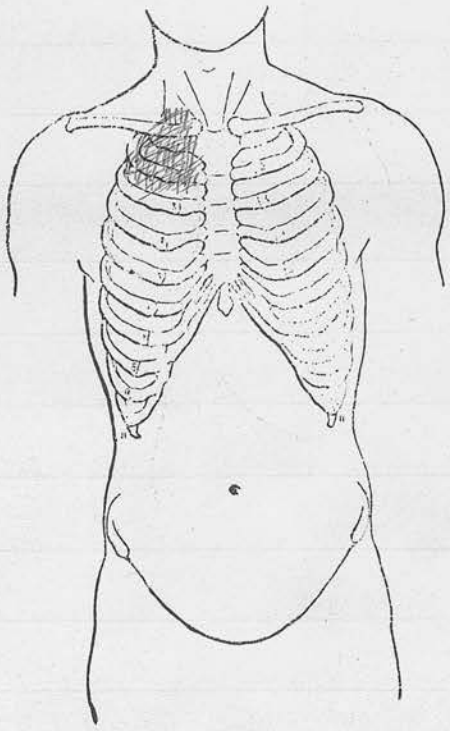


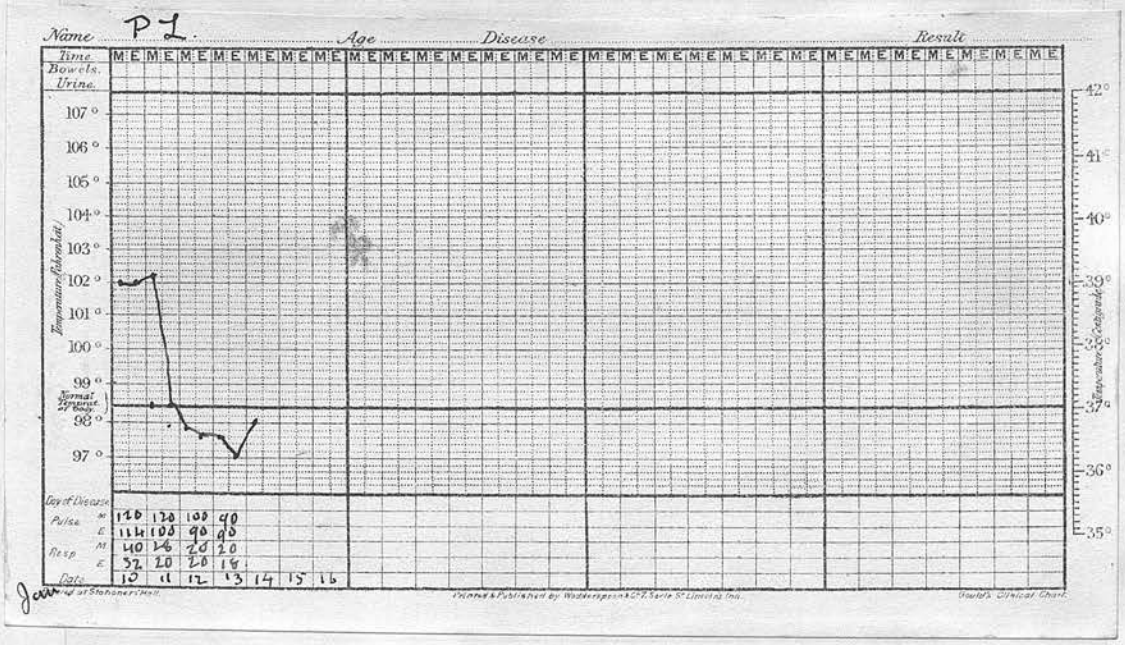

Name J. J.
Age
Disease
Result
Time
Bowels
Urine
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
Normal temperature of Body
Temperature (Fahrenheit)
Temperature (Centigrade)
42°
41°
40°
39°
38°
37°
36°
35°
Day of Disease
Pulse
Resp
Date
120 120 98 120 110 92 92 76
100 122 120 132 104 84 80 76
50 50 48 48 60 48 36 28
48 48 48 60 60 52 32 24
25 26 27 28 29 30 31 1 2 3 4 5
July
Aug
Printed & Published by Wedderspoon & Co. Seeta & Limited, Inc.
Gould's Clinical Chart



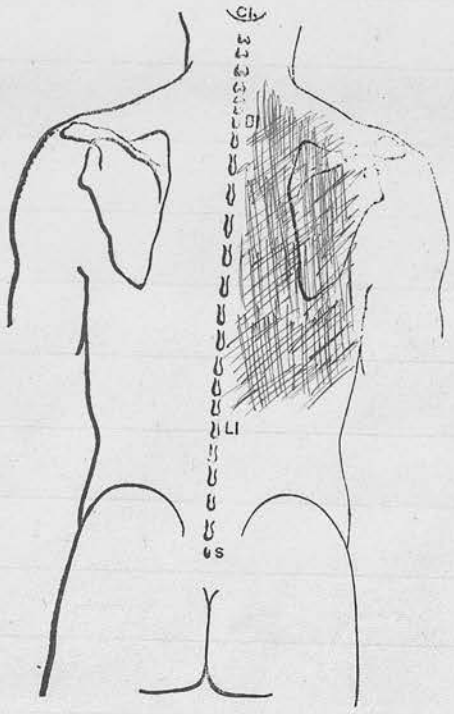
These are the charts of two attacks in one person following on one another within fourteen months.

CASE 8.




Name P L.
Age
Disease
Result
Time
Bowels.
Urine.
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
107°
106°
105°
104°
103°
102°
101°
100°
99°
Normal Temperature of Body
98°
97°
Temperature Fahrenheit
42°
41°
40°
39°
38°
37°
36°
35°
Temperature Centigrade
Day of Disease
Pulse M 120 120 100 90
E 114 100 90 90
Resp M 40 26 20 20
E 32 20 20 18
Date 10 11 12 13 14 15 16
Printed & Published by Wadderspoon & Co 7 Savile St London Ins.
Gould's Clinical Chart.

CASE 9.



Name D K. Age Disease Result

Time	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Bowels.																																
Urine.																																

Temperature (Fahrenheit): 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°
Normal Temperature of Body
Temperature (Centigrade): 42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease									
Pulse	M		96	72	80	74	74		
	E	100	92	72	108	80	76		
Resp.	M		32	32	30	26	20		
	E	36	36	24	42	20	20		
Date		22	23	24	25	26	27	28	29

Entered at Stationers Hall.

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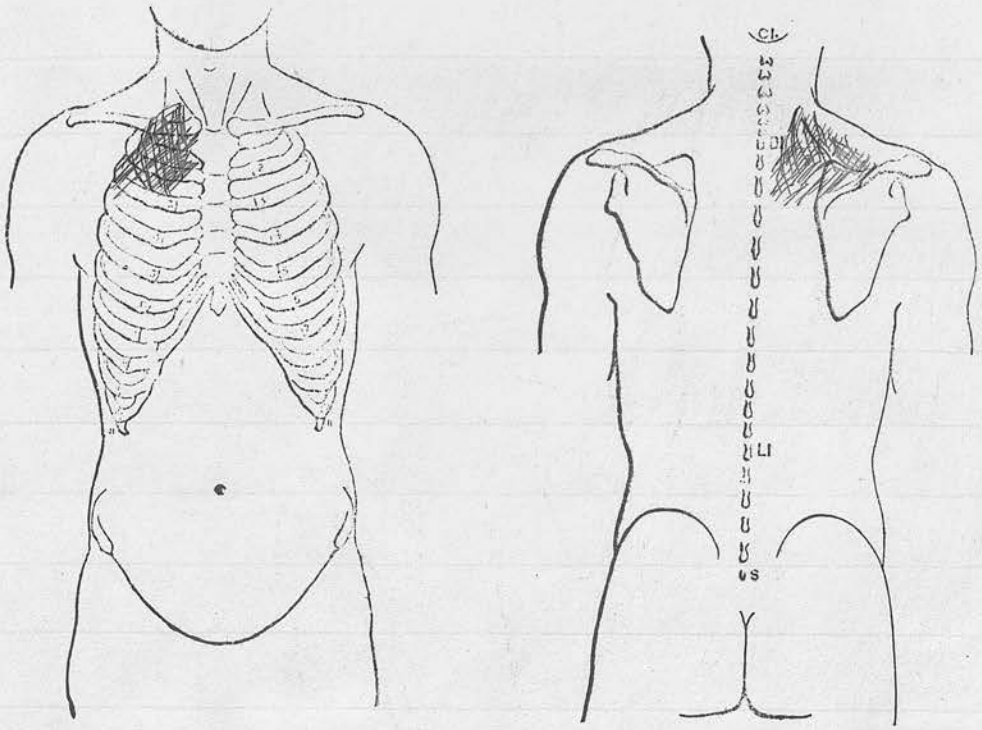
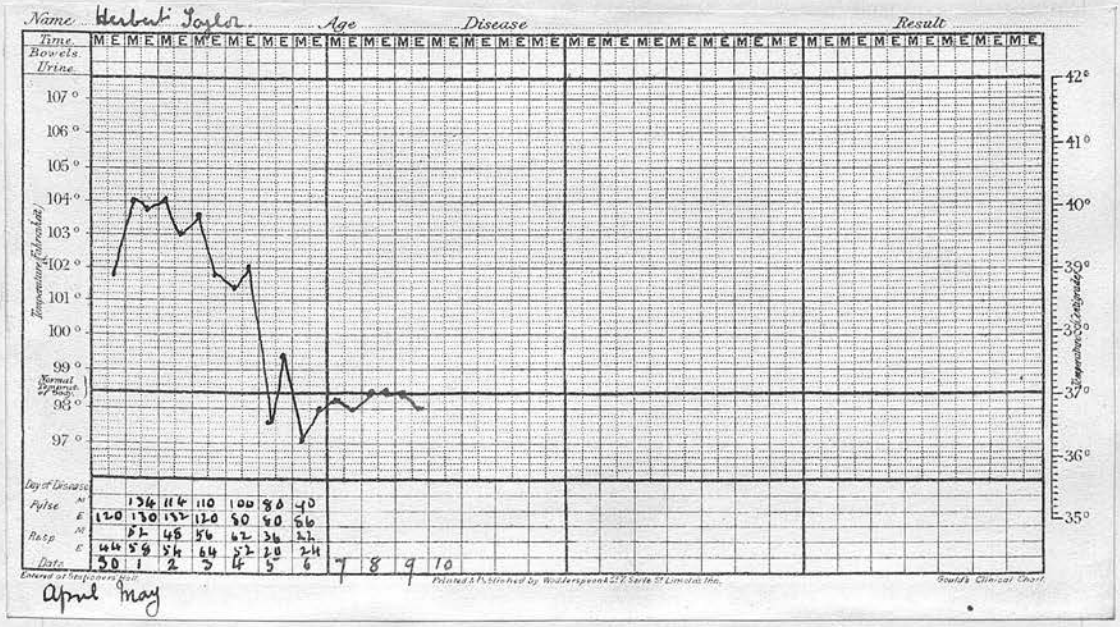
Gould's Clinical Chart.

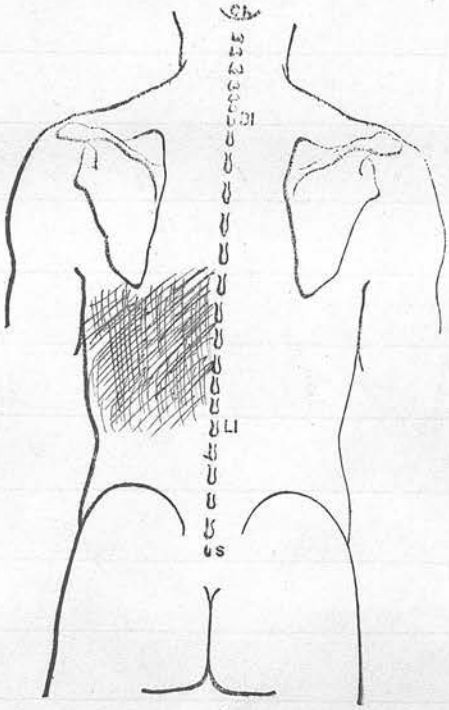
May

CASE 11.


Cl.
D
LI
US


Name Herbert Taylor
Age
Disease
Result
Time
Bowels
Urine
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
42°
41°
40°
39°
38°
37°
36°
35°
Day of Disease
Pulse
Resp
Date
30 1 2 3 4 5 6 7 8 9 10
April May

CASE 12.



Name John Roberts Age Disease Result

Time. M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E

Bowels.

Urine.

Temperature Fahrenheit

107° 106° 105° 104° 103° 102° 101° 100° 99° Normal Temperature of body 98° 97°

Temperature Centigrade

42° 41° 40° 39° 38° 37° 36° 35°

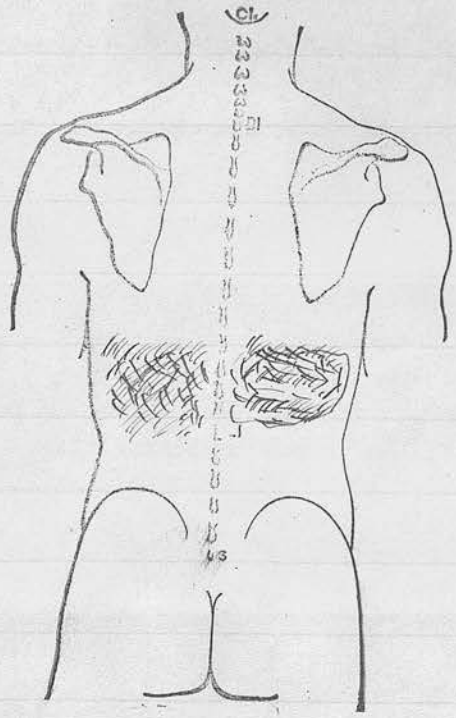
Day of Disease

		1	2	3	4	5	6	7	8	9	10	11	12	13.
Pulse	M			84	88	80	80							
	E	96		84	86	76	80							
Resp	M			48	36	32	24							
	E	36	48	48	30	20								
Date		4	5	6	7	8	9	10	11	12	13.			

Entered at Stationers' Hall November

Printed & Published by Wadderspoon 127 Savile St Lincoln Inn. Gould's Clinical Chart

CASE 13.



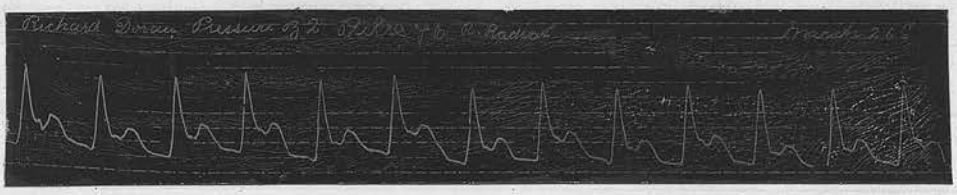
Name Richard Doran Age Disease Result

Time
Bowels
Urine

Temperature Fahrenheit — Normal Temperature of Body — Temperature Centigrade

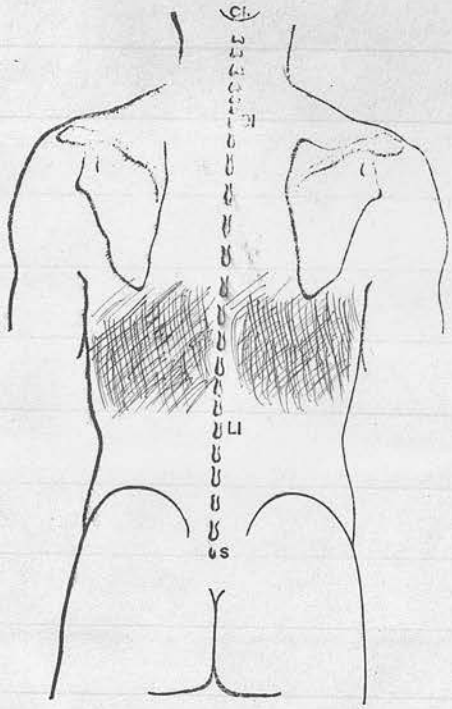
Day of Disease											
Pulse	M		88	117	112	104	120	84	68	48	48
	E	112	120	120	92	120	112	90	60	56	56
Resp	M	28	32	40	40	48	40	30	20	32	32
	E		32	48	42	40	44	36	20	20	20
Date		20	21	22	23	24	25	26	27	28	

Printed & Published by Wodderspoon & Co. Castle St. Lincoln Ltn. Gould's Clinical Chart



Pulse tracings show dicrotism.

CASE 14.



Name Edward Smith Age Disease Result

Time
Bowels.
Urine.

M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E

107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°

Temperature (Fahrenheit)
Normal Temperature of Body

42°
41°
40°
39°
38°
37°
36°
35°

Temperature (Centigrade)

Day of Disease

Pulse.	M	120	104	96	86			
	E	112	98	96	84			
Resp.	M	54	28	32	20			
	E	50	34	28	24			
Date		9	10	11	12	13	14	15

Entered at Stephanie Hall.
May 9.

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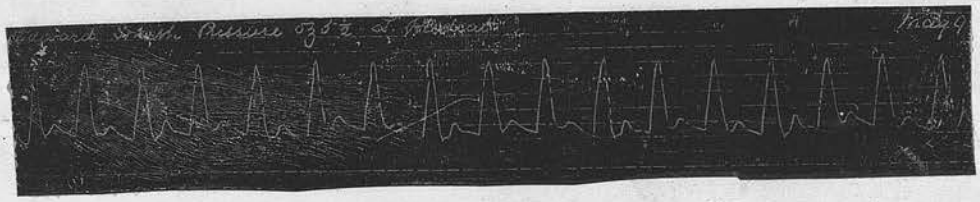
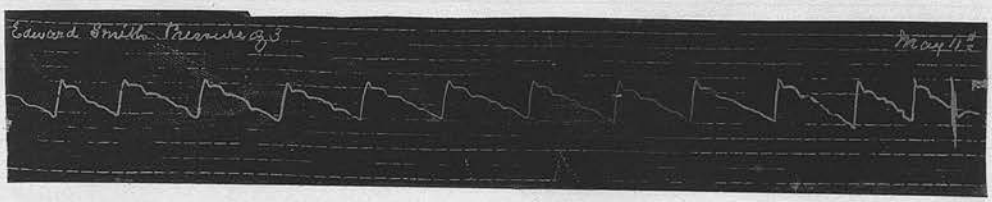
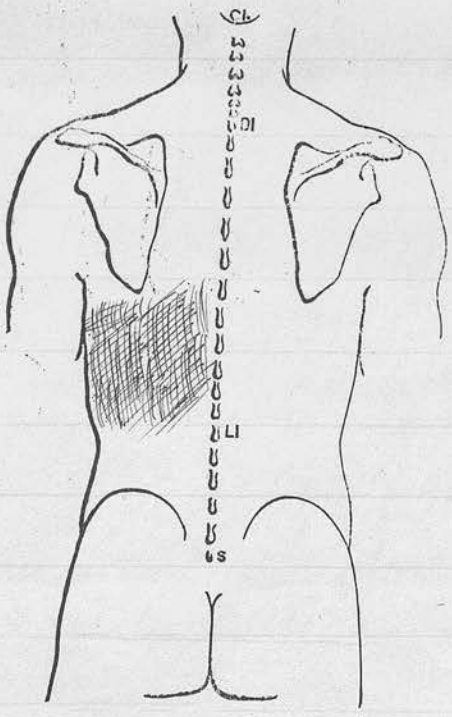
Heath's Clinical Chart.





Pulse tracings before and after the crisis.

CASE 15.



Name John Bollard. Age Disease Result

Time
Bowels.
Urine.

	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Day of Disease																																
Pulse					100	92	72	80																								
		100			104	96	72	78																								
Resp					24	32	28	24																								
		36		36	28		24	20																								
Date		16		17	18		19	20	21		22		23		24		25															

Temperature (Fahrenheit): 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°
Normal Temperature of body
Temperature (Centigrade): 42° 41° 40° 39° 38° 37° 36° 35°

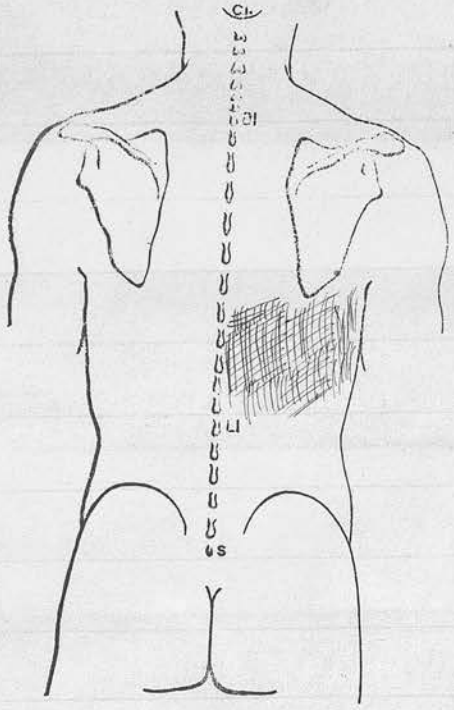
Entered at Stationers' Hall.

December

Printed & Published by Wooderson & Co. 7 Serle St. Lincoln's Inn.

Roulh's Clinical Chart

CASE 16.



Name John Fallus Age Disease Result

Time M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E

Bowels.

Urine.

Temperature (Fahrenheit)

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Normal Temperature of Body

Temperature (Centigrade)

42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease												
Pulse	M		96	100	80	86	76					
	E	104	100	100	80	76	74					
Resp	M		32	32	20	24	20					
	E	28	28	32	20	24	20					
Date		28	26	27	28	29	30	1	2	3	4	5

Entered at Stationers' Hall

September below

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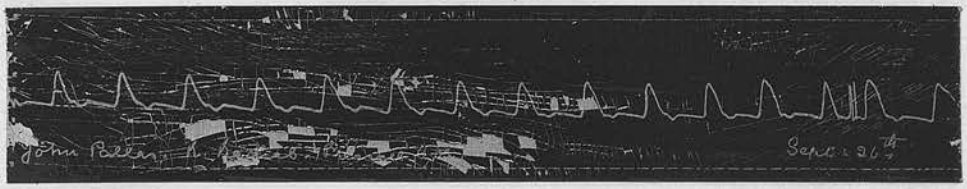
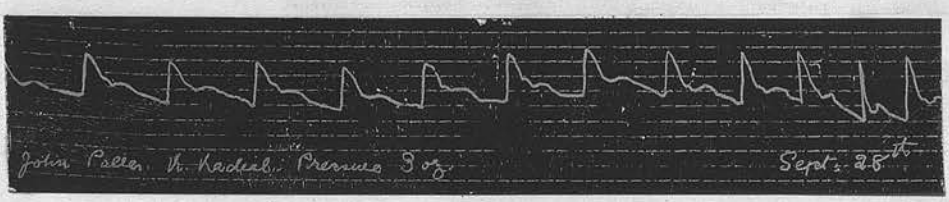
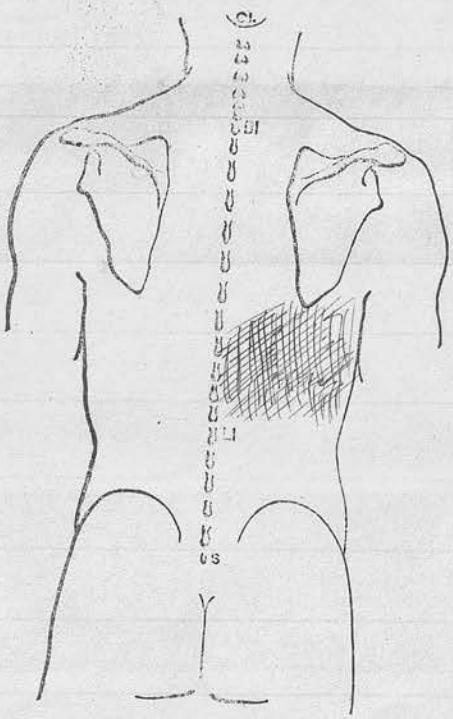
Fowler's Clinical Chart





Consecutive tracings taken during the course of the disease. The first tracing shows well-marked anacrotic condition of the pulse.

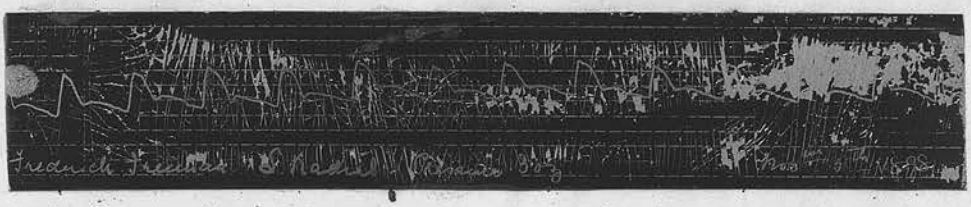
CASE 17.

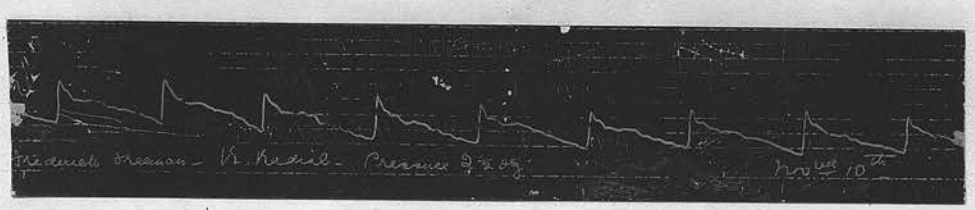


Name F. F. Age Disease Result

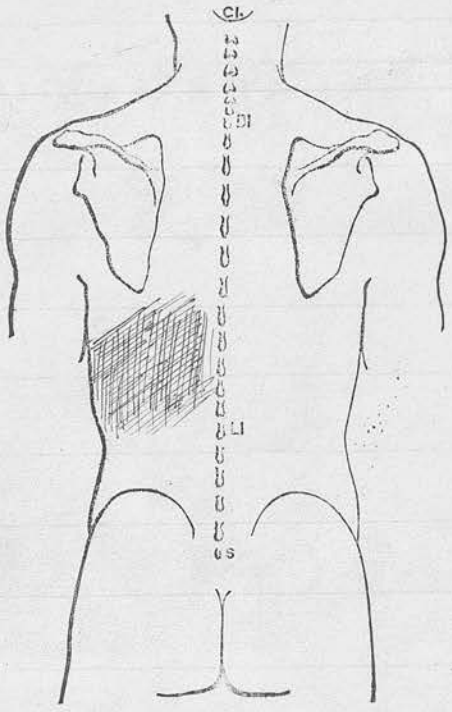
Time
Bowels.
Urine.

M E M E M E





CASE 18.



Name JJ. Age 22 Disease Result

Time	M E M E M E M E M E M E M E	M E M E M E M E M E M E M E	M E M E M E M E M E M E M E	M E M E M E M E M E M E M E						
Bowels										
Urine										
Day of Disease										
Pulse M		108	120	110	106	104	108	100	76	
Pulse E	112	100	120	112	108	112	96	84	84	
Resp. M		48	50	58	48	44	44	28	32	
Resp. E	48	48	56	56	48	52	44	30	28	
Date	26	27	28	29	30	1	2	3	4.	5

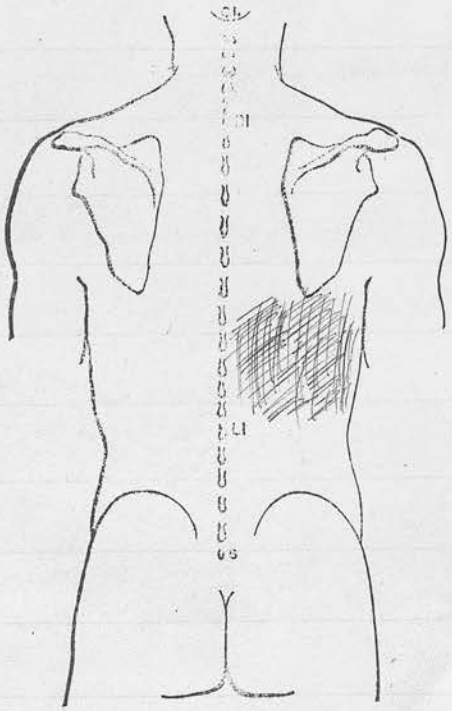
Temperature Fahrenheit: 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°
Normal Temperature of Body
Temperature Centigrade: 42° 41° 40° 39° 38° 37° 36° 35°

Entered at Stationers' Hall.

April

Printed & Published by Waddington & C° 7 Serle St Lincolns Inn. Gould's Clinical Chart.

CASE 19.



Name J. H. P. Age Disease Result

Time
Bowels.
Urine.

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Temperature (Fahrenheit)

Normal Temperature of Body

42° 41° 40° 39° 38° 37° 36° 35°

Temperature (Centigrade)

Day of Disease

Pulse	M	120	80	72	
	E	104	84		
Resp	M	40	20	20	
	E	36	24		
Date		14	15	16	17.

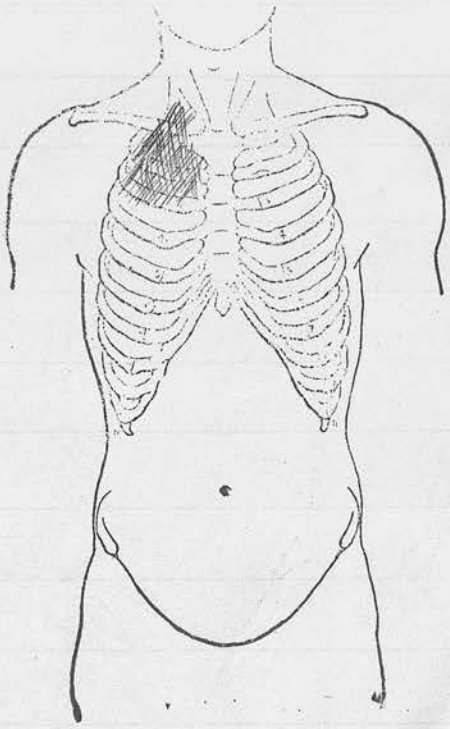
Entered at Stationers' Hall.

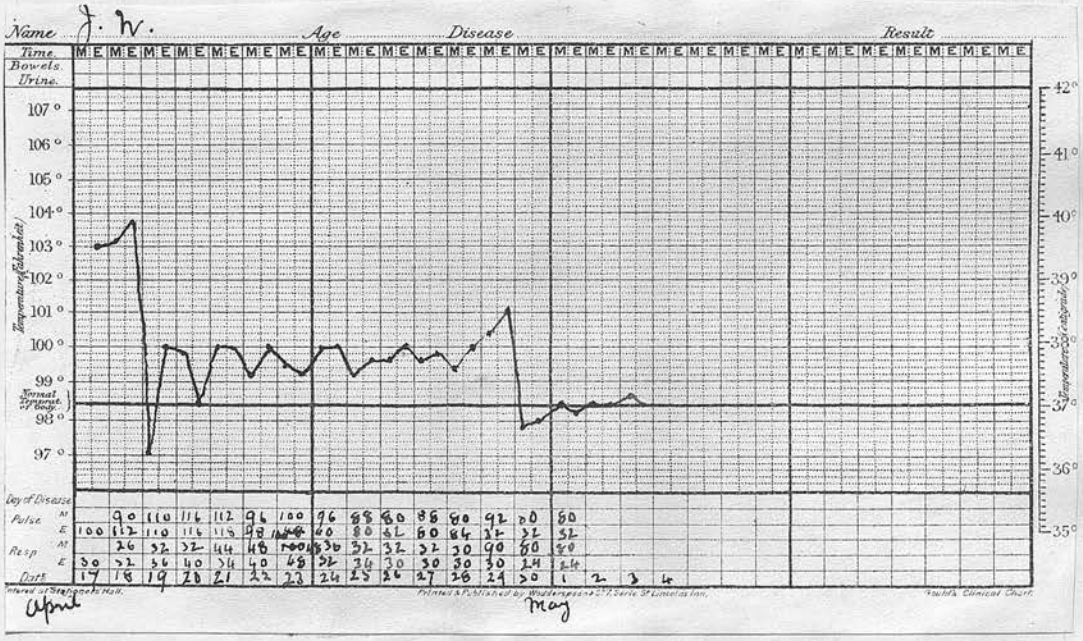
Sept 14

Printed & Published by Waddington & Co. 7 Earle St. Lincoln Inn.

Ward's Clinical Chart.

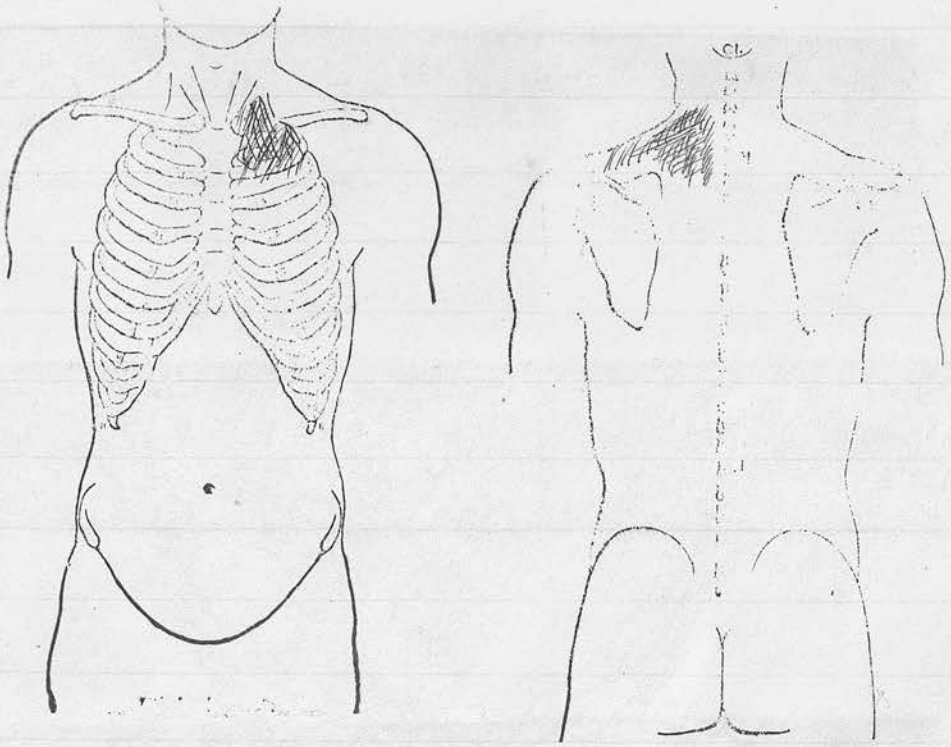
CASE 20.

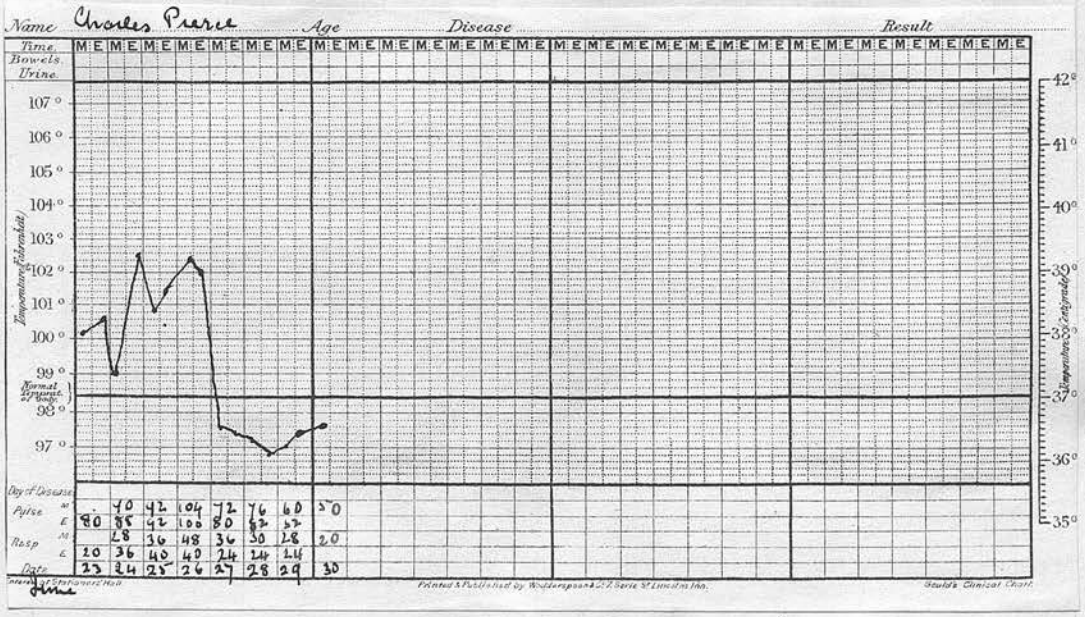


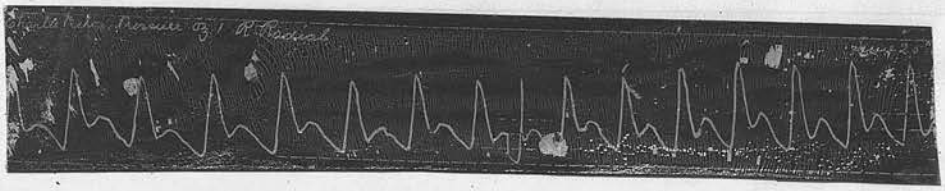


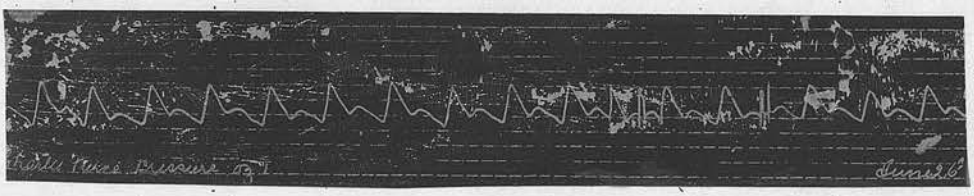
This chart shows the effect of the tank on the temperature.

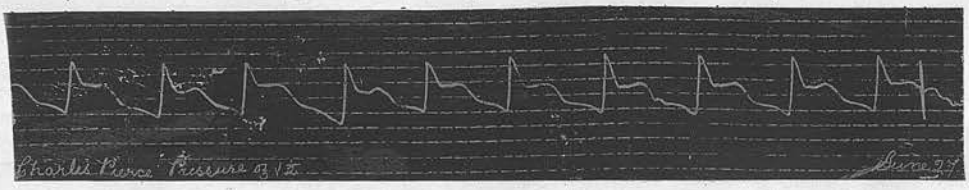
CASE 21.

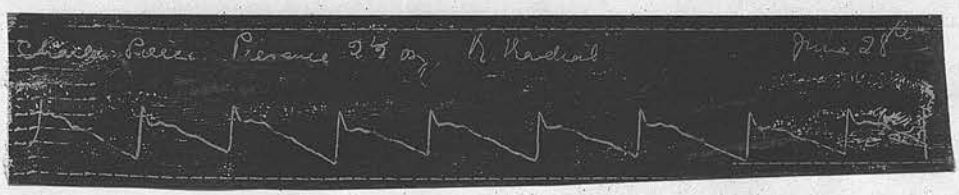



Name Charles Pierce
Age
Disease
Result
Time
Bowels.
Urine.
Temperature Fahrenheit
Normal Temperature of Body
Temperature Centigrade
Day of Disease
Pulse
Resp
Date
Printed & Published by Woodward & Tiernan Printing Co. St. Louis Mo.
Gould's Clinical Chart

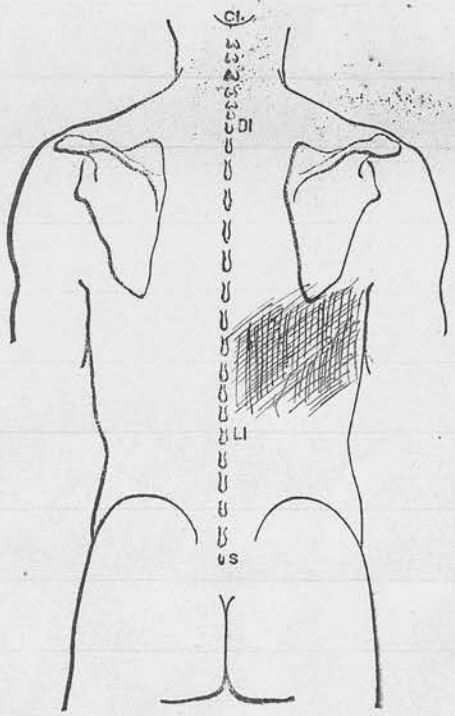


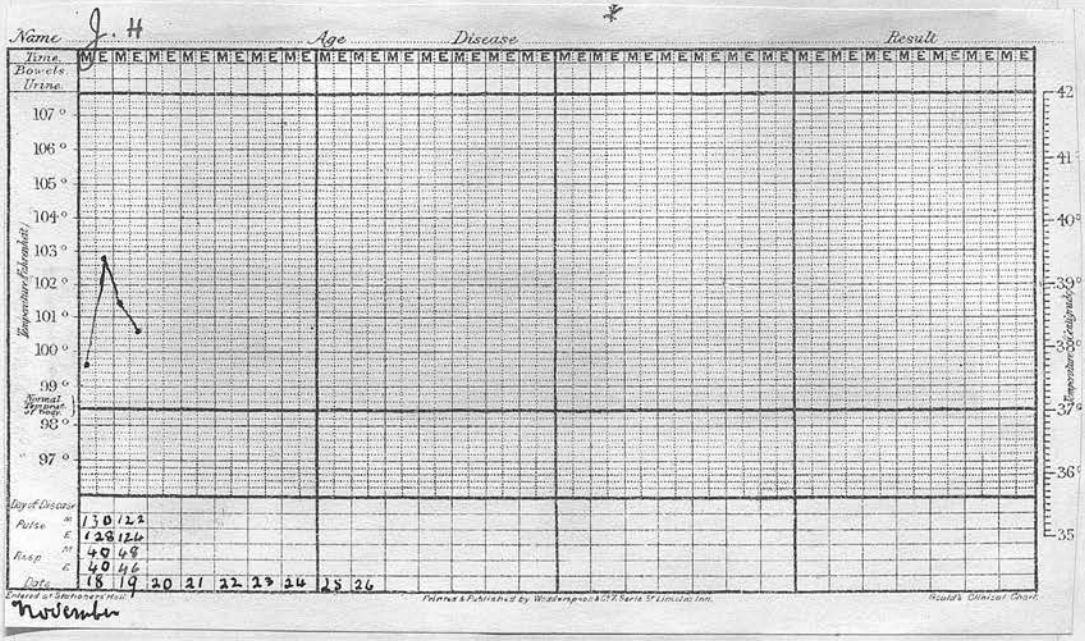




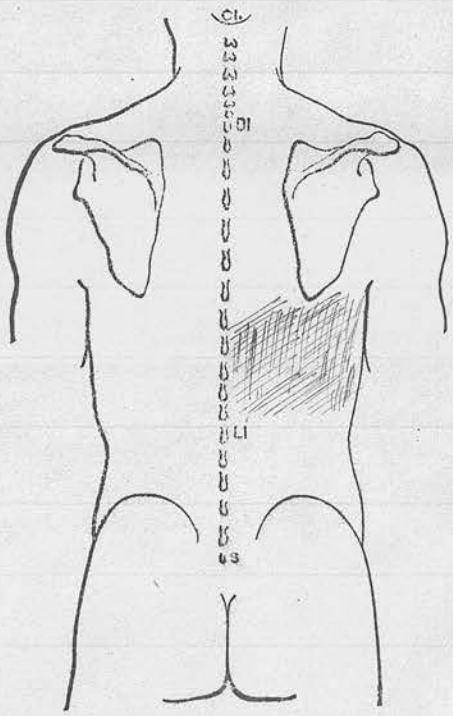


CASE 22.


Cl.
DI
LI
US


Name J. H
Age
Disease
Result
Time
Bowels
Urine
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
Temperature Fahrenheit
Normal Temperature of Body
42
41
40°
39°
38°
37°
36°
35
Temperature Centigrade
Day of Disease
Pulse M 130 122
E 128 126
Resp M 40 48
E 40 46
Date 18 19 20 21 22 23 24 25 26
Entered at Stationers Hall
November
Printed & Published by Wm Bevington & Co 8 Paris St Limited Inn.
Arnold's Clinical Chart

CASE 23.



Name H. S. Age Disease Result

Time. M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E

Bowels.

Urine.

Temperature Fahrenheit

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Normal Temperature of Body

Temperature Centigrade

42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease

Pulse M 136

E 120 146

Resp M 64.

E 52 56

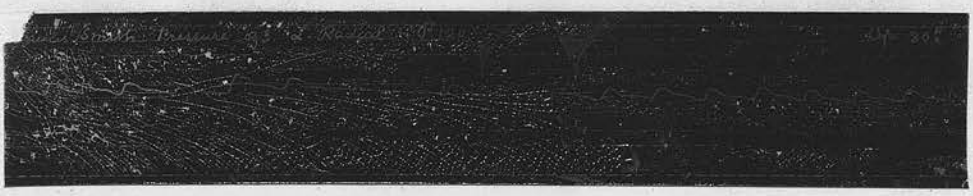
Date 10 21 22 23 24

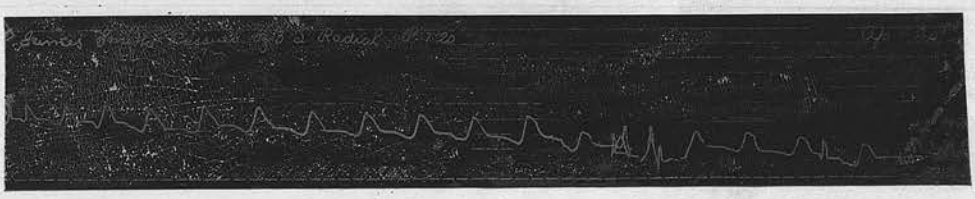
Entered at Stationers Hall.

Printed & Published by Waterlow & Sons Limited, 24 Birchin Lane, London.

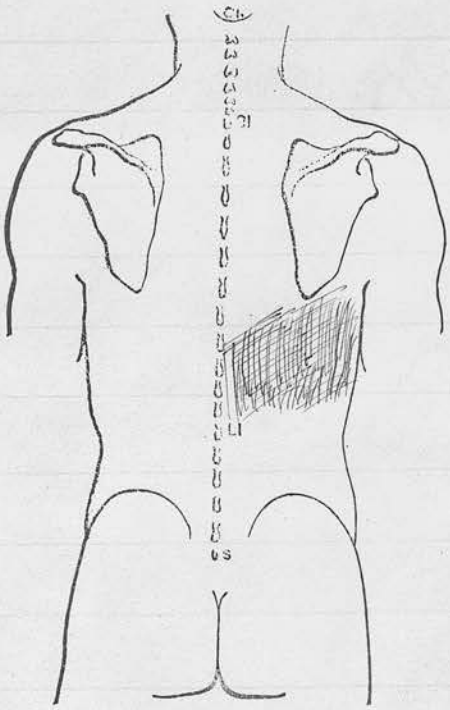
Gould's Clinical Chart

April





CASE 24.



Name A. J. Age Disease Result

Time
Bowels.
Urine.

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Temperature (Fahrenheit)

Normal Temperature of Body

42° 41° 40° 39° 38° 37° 36° 35°

Temperature (Centigrade)

Day of Disease							
Pulse	M	96	94	72	68	68	
	E	64	99	70	80		
Resp	M	48	36	32	28		
	E	44	33	32	20	20	
Date		10	11	12	13	14	15 16

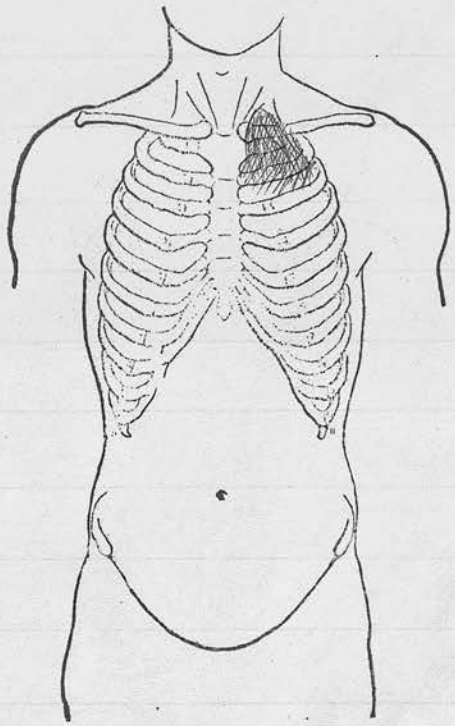
Entered at Stephenson's Hall.

Chas

Printed & Published by Waddington & Co. 257 Park St. Lincoln Inc.

Tonsil's Clinical Chart.

CASE 25.



Name James Patton Age 40 Disease Result

Time M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E

Bowels.
Urine.

Temperature (Fahrenheit)
107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°
(Normal Temperature of Body)

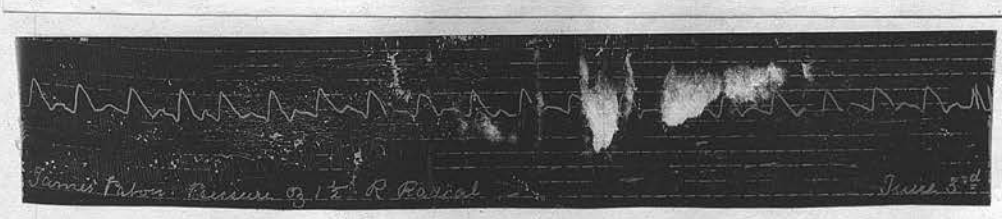
Temperature (Centigrade)
42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease

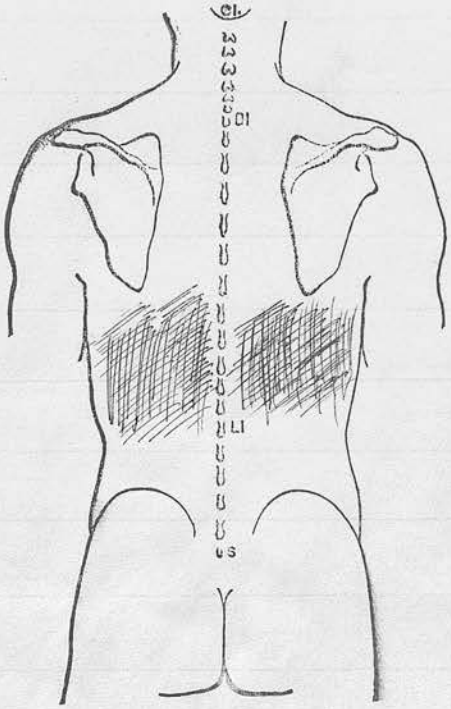
Pulse	M			132	120	
	E	128	116			
Resp	M			60	56	
	E	56	56			
Date		2	3	4	5	6

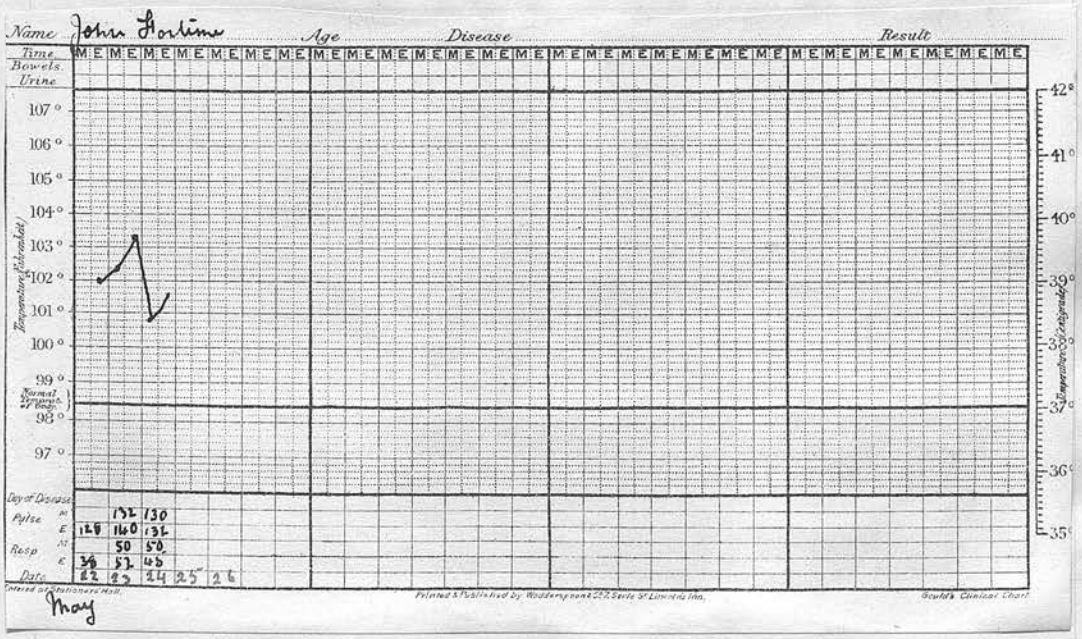
June

Printed & Published by Wadderspoon & 27, Serle St. Lincoln's Inn. Gowlett's Clinical Chart.

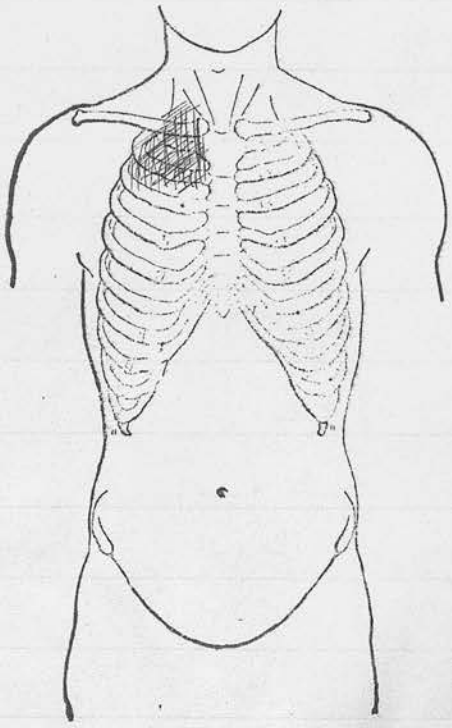


CASE 26.


Cl.
D1
L1
S


Name John Hortins
Age
Disease
Result
Time
Bowels
Urine
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
Temperature (Centigrade)
42°
41°
40°
39°
38°
37°
36°
35°
Day of Disease
Pulse
Resp
Date
132 130
128 160 132
50 50
38 52 45
22 23 24 25 26
May
Printed & Published by Waddington & Co. 22 Castle St. Liverpool Eng.
Gould's Clinical Chart

CASE 27.



Name Joseph Rodgers. Age Disease Result

Time M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E

Bowels.

Urine.

Temperature Fahrenheit

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Normal Temperature at Birth

Temperature Centigrade

42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease

Pulse M E 140

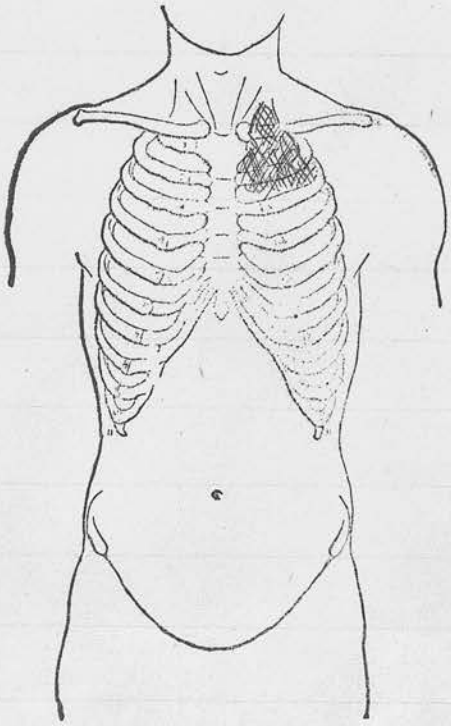
Resp M E 60

Date 9 10 11 12 13

Sept

Entered at Stationers Hall. Printed & Published by Wadsworth 207 Sixth St Lincoln, Neb. Gould's Clinical Chart

CASE 28.



Name William Kerr. Age Disease Result

Time
Bowels
Urine

Day of Disease					
Pulse	M		144	152	152
	E	128	134	160	160
Resp.	M		40	60	50
	E	40	48	44	40
Date		13	14	15	16.

Temperature (Fahrenheit): 107° 106° 105° 104° 103° 102° 101° 100° 99° (Normal Temperature of Body) 98° 97°

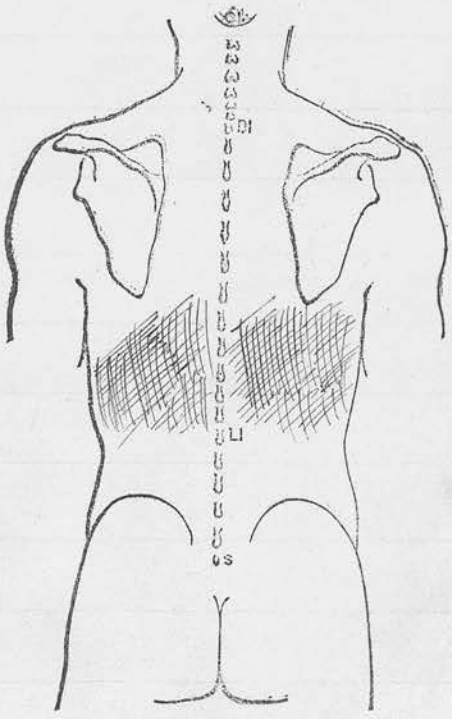
Temperature (Centigrade): 42° 41° 40° 39° 38° 37° 36° 35°

Entered at Stationers Hall.

Printed & Published by Rodden Lyons & Co 7 Earle St Limerick Ire.

Gould's Clinical Chart

CASE 29.



Name Eliza. Kavanagh. Age Disease Result

Time
Bowels.
Urine.

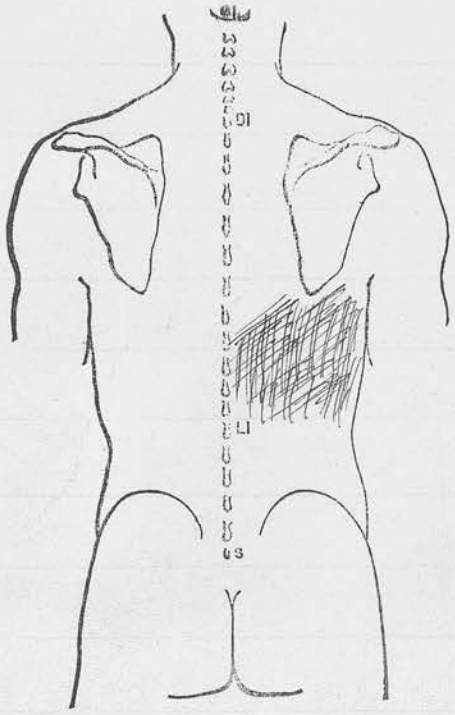
Temperature Fahrenheit: 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°
Normal Temperature of Body
Temperature Centigrade: 42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease
Pulse M. 136 144 150
E. 144
Resp. M. 32 40
E. 24 40
Date 28 29 30 1 2 3 4 5

Entered at Stationers Hall. Nov. Dec

Printed & Published by Waddington & Co. 7 Castle St. Liverpool Eng. Gould's Clinical Chart.

CASE 30.



Name Patrick Brody Age Disease Result

Time
Bowels.
Urine.

Temperature Fahrenheit

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Normal Temperature of Body

Temperature Centigrade

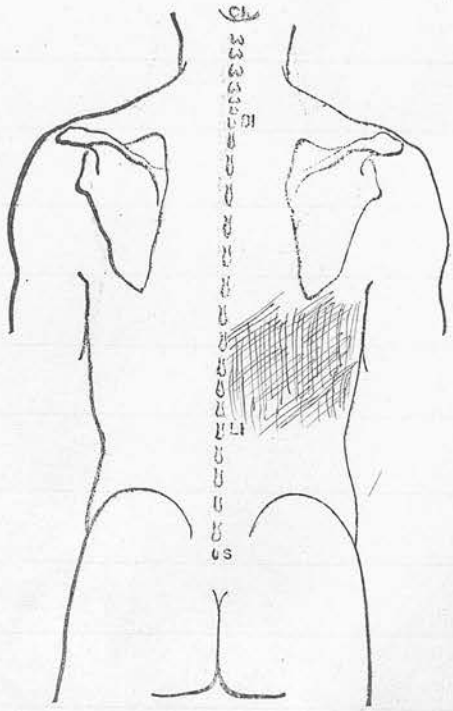
42° 41° 40° 39° 38° 37° 36° 35°

Days of Disease						
Pulse	M	140	140			
	E	126	144			
Resp	M	44	40			
	E	36	45			
Date		29	30	31	1	2.

December

Entered at Stationers' Hall. Printed & Published by Wooderspoon & Co. 2 & 3 Serle St. Lincolns Inn. Gould's Clinical Chart.

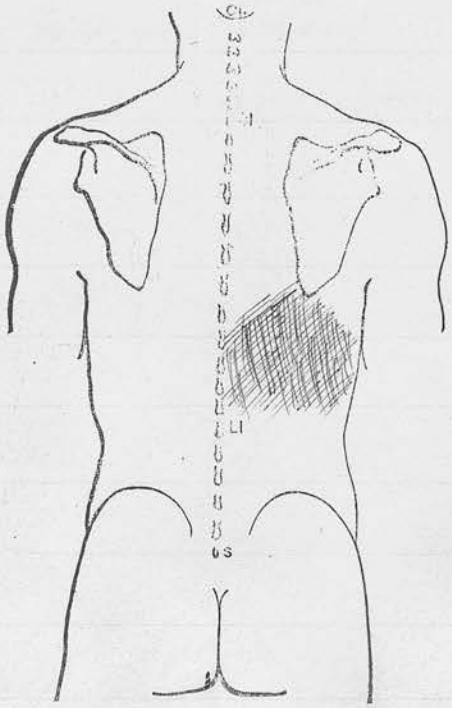
CASE 31.



Name Edward Green. Age Disease Result

| | | |

CASE 32.

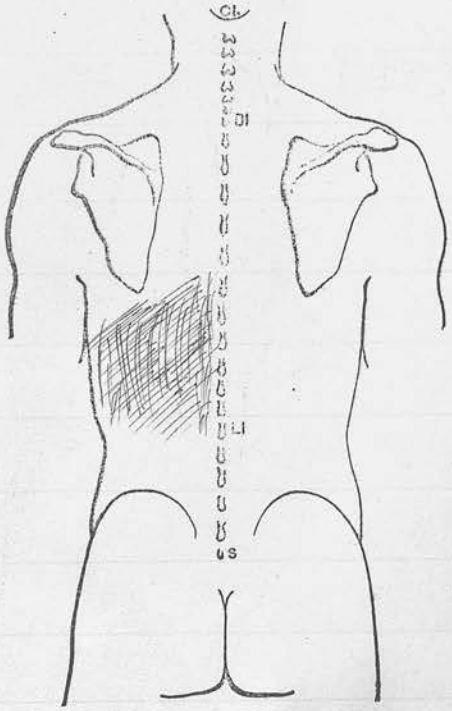


Name Benj. Robinson Age Disease Result

Time
Bowels
Urine

| | | |

CASE 33.



Name Thomas Whittle Age Disease Result

Time	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E
Bowels.																														
Urine.																														

Temperature (Fahrenheit)

107° 106° 105° 104° 103° 102° 101° 100° 99° Normal Temperature of body 98° 97°

Temperature (Centigrade) 42° 41° 40° 39° 38° 37° 36° 35°

Day of Disease									
Pulse	M		104	104	120	142			
	E	132	120	144	144	148			
Resp.	M		36	36	38	50			
	E	40	80	48	60	62			
Date		21	22	23	24	25	26	27	28

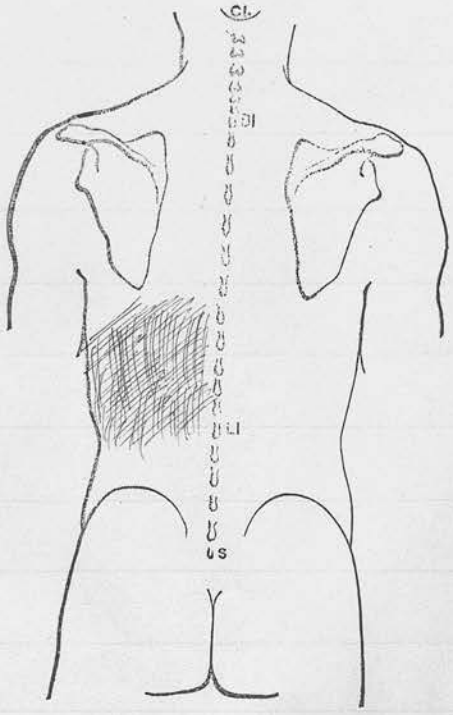
Entered at Stationers' Hall

Apse

Printed & Published by Wadderspoon & Co. 7, Savile St. Lincoln Inn.

Gould's Clinical Chart

CASE 34.



Name Ann Grady Age Disease Result

Time	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Bowels.																																						
Urine.																																						

Temperature (Fahrenheit)

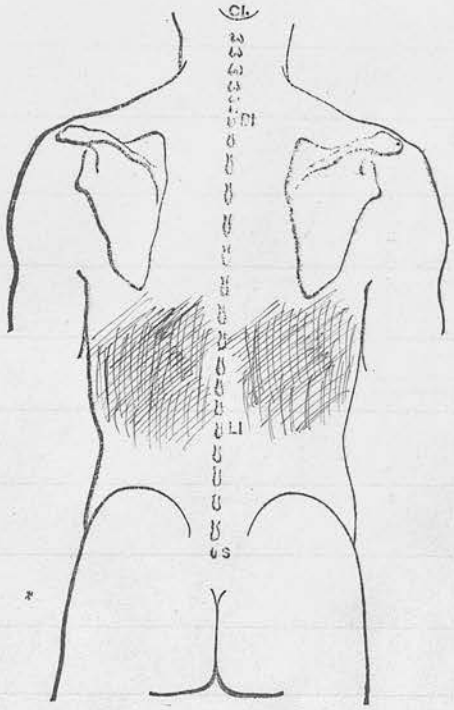
107° 106° 105° 104° 103° 102° 101° 100° 99° Normal Temperature of Body 98° 97°

42° 41° 40° 39° 38° 37° 36° 35° Temperature (Centigrade)

Day of Disease									
Pulse	M		100	108	105	100	116	120	136
	E	94	100	108	106	102	118	132	
Resp	M		20	24	34	36	48	48	56
	E	24	40	40	42	48	48	48	
Date		10	11	12	13	14	15	16	17

Entered at Stationers' Hall. Printed & Published by Waddington & Co. 7, Serle St. Lincoln's Inn. Gould's Clinical Chart.

CASE 35.



Name John Hay Age Disease Result

Time
Bowels.
Urine.

M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E

107°
106°
105°
104°
103°
102°
101°
100°
99°
Normal Temperature of Body
98°
97°

Temperature Fahrenheit

Temperature Centigrade

42°
41°
40°
39°
38°
37°
36°
35°

Day of Disease

Pulse M E 144

Resp M E 36.

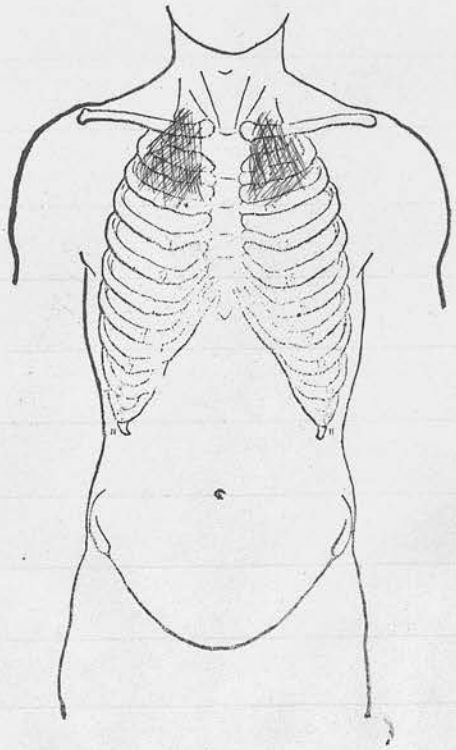
Date 12

Entered Dec. Discharged.

Printed & Published by Wadsworth and Co 7 Serle St Lincolns Inn.

Gould's Clinical Chart

CASE 36.



Name Sarah Craddock Age Disease Result

Time	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Bowels.																														
Urine.																														

Temperature (Fahrenheit) 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

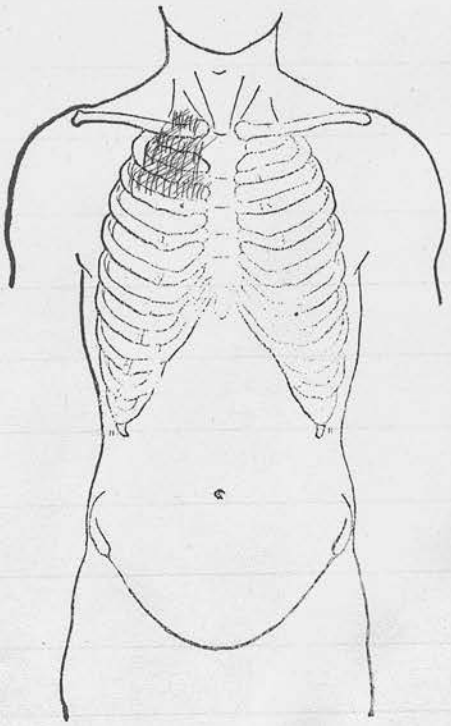
Temperature (Centigrade) 42° 41° 40° 39° 38° 37° 36° 35°

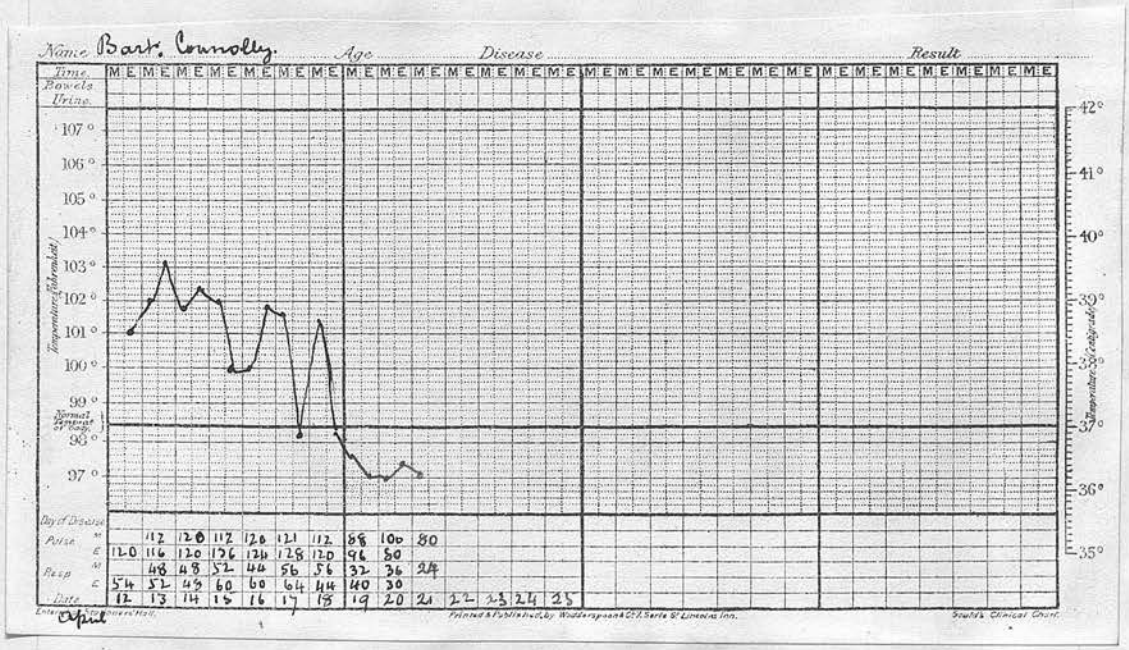
Days of Disease														
Pulse	M		104	108	128	118	116	120	126	124	138	142	140	
	E	126	116	120	134	126	126	130	140	144	148	148	130	
Resp	M		20	20	40	38	24	26	24	28	40	40	36	
	E	30	22	24	36	26	22	26	30	44	30	44	30	
Date		9	10	11	12	13	14	15	16	17	18	19	20	

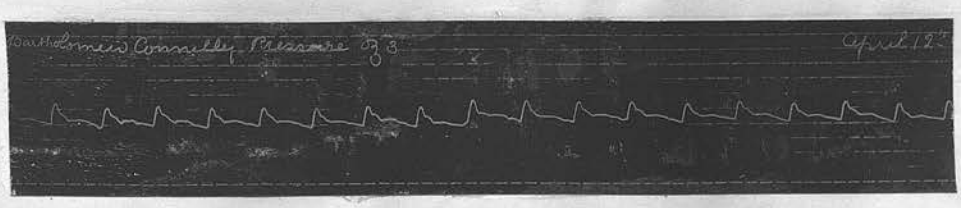
Entered at Stationers' Hall. Jan.

Printed & Published by Wadderspoon & Co. 79 Bertie St. Lincoln Inn. Gould's Clinical Chart

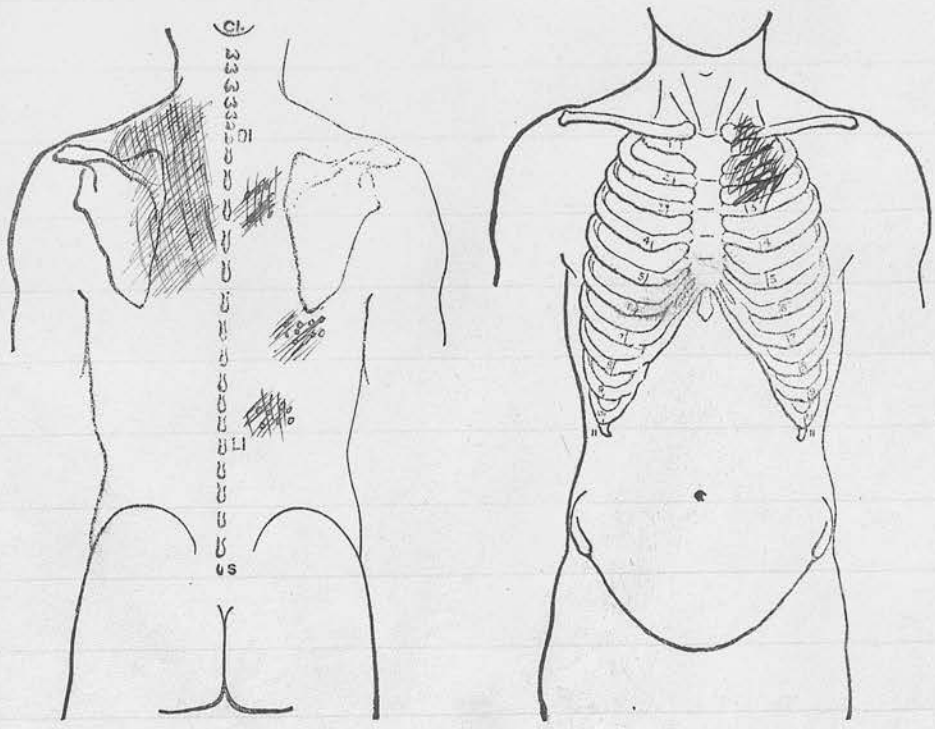
CASE 37.

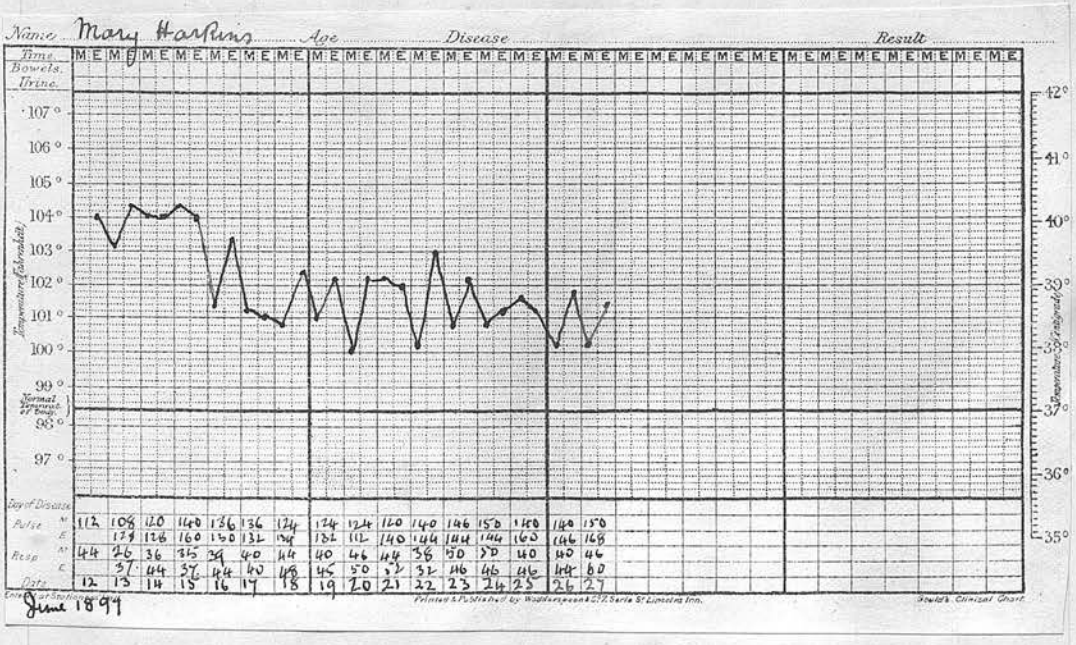



Name Bart. Connolly.
Age
Disease
Result
Time
Bowels
Urine
Temperature Fahrenheit
Normal Temperature or Oasis
Temperature Centigrade
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
42°
41°
40°
39°
38°
37°
36°
35°
Day of Disease
Pulse
Resp
Date
April
Printed & Published by Waddington & Co. 1. Bartle St. Lincolns Inn.
Smith's Clinical Chart.

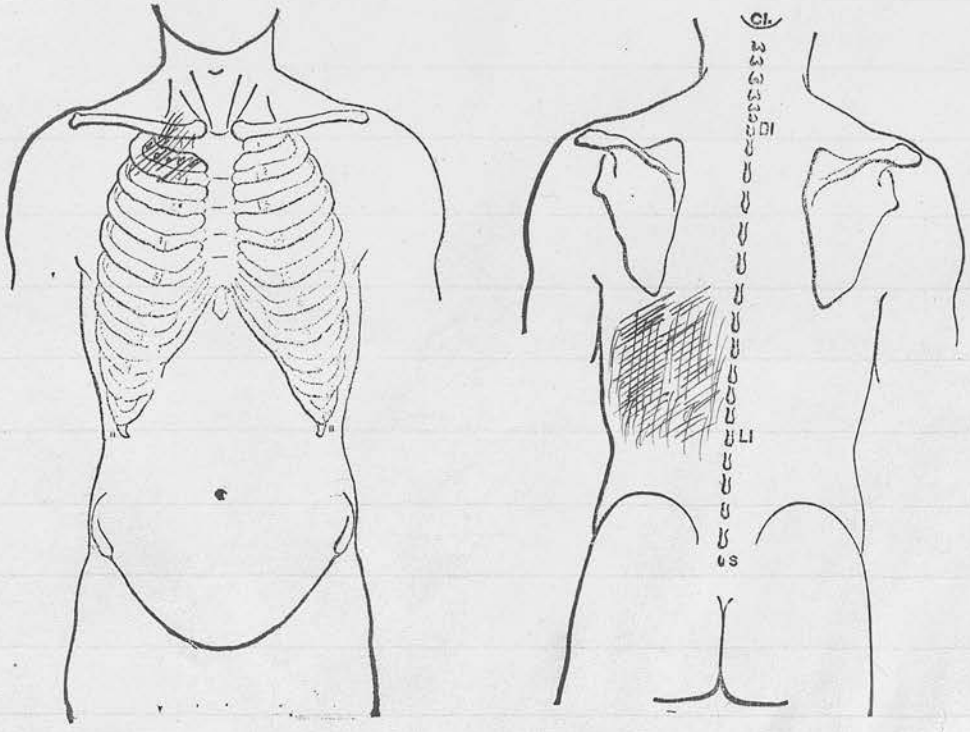

Bart. Connolly. Pressure
April 12

CASE 38.


Cl.
DI
LI
Us


Name Mary Harkins
Age
Disease
Result
Time
Bowels.
Urine.
Temperature Fahrenheit
Temperature Centigrade
Normal Temperature
Pulse
Resp
Day of Disease
Date
June 1899
Printed & Published by Waddington & C° 7 Carle St Lincolns Inn.
Standard Clinical Chart

CASE 39.



Name Ada Brickland Age Disease Result

Time
Bowels
Urine

Temperature (Fahrenheit)
107°
106°
105°
104°
103°
102°
101°
100°
99°
Normal Temperature of Body
98°
97°

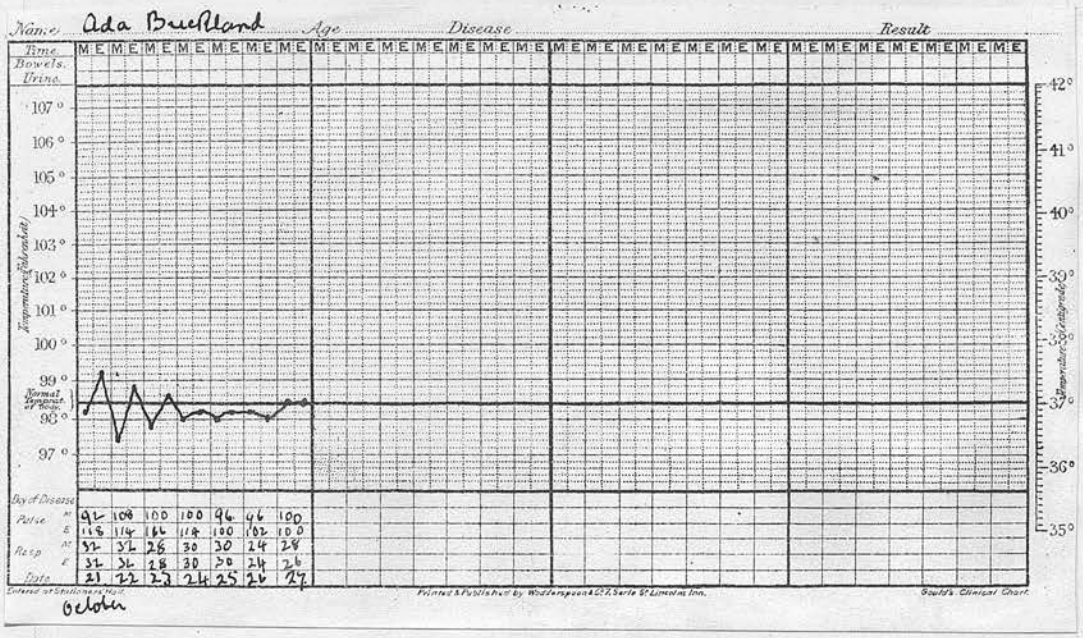
Temperature (Centigrade)
42°
41°
40°
39°
38°
37°
36°
35°

Day of Disease

		M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
Pulse	M	128 138 124 120 124 112 120 120 124 112 120 120 112 108 132 126 118 104 100 96 64 60 96 112 100 108 104
	E	136 136 130 136 124 114 140 126 132 130 124 132 132 126 116 120 120 120 104 98 110 102 106 120 108 106 106 114
Resp	M	36 50 44 48 56 54 52 52 44 40 52 50 44 42 50 48 40 44 36 40 40 36 32 36 32 24 24
	E	40 48 52 50 52 42 48 58 54 52 44 52 52 50 44 48 48 48 40 44 46 40 40 40 32 34 36 30
Date		23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Entered at Stationers' Hall. Septemb Octobr

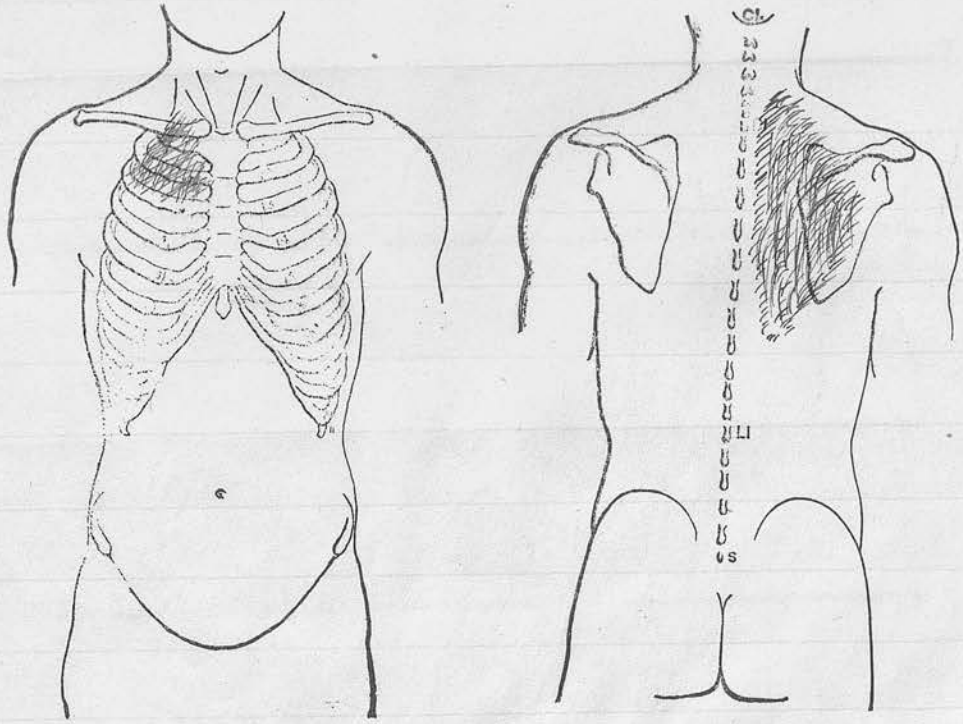
Printed & Published by Widdershoven & Zoon's Bureau of Utrecht Ltd. Student Clinical Chart.



Name. Ada Buckland Age. Disease. Result.

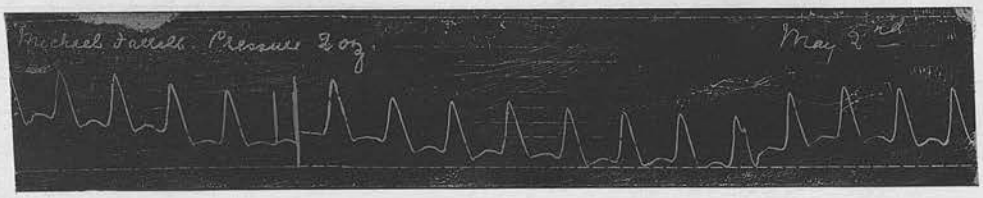
Time. M E M E M E

CASE 40.



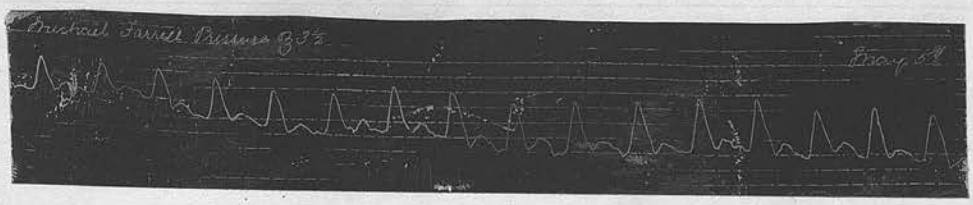
Name Michael Farrell Age Disease Result

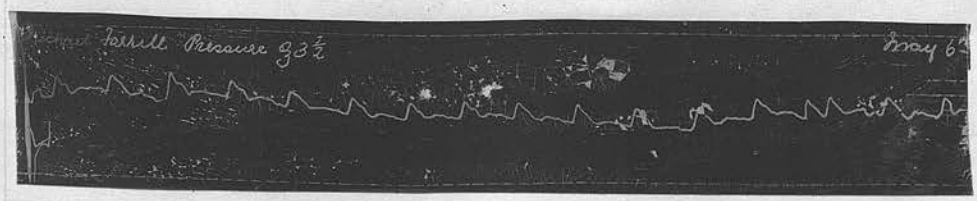
| | | |

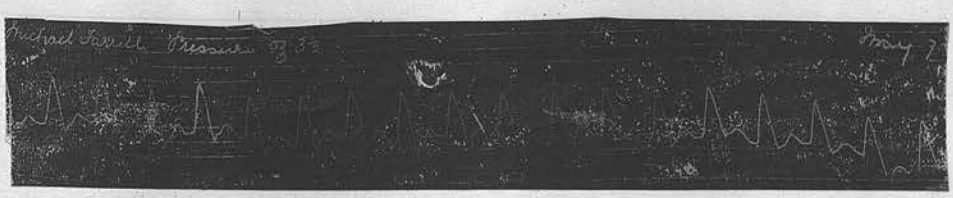

Michael Farrell Pressure 2 oz.
May 2nd

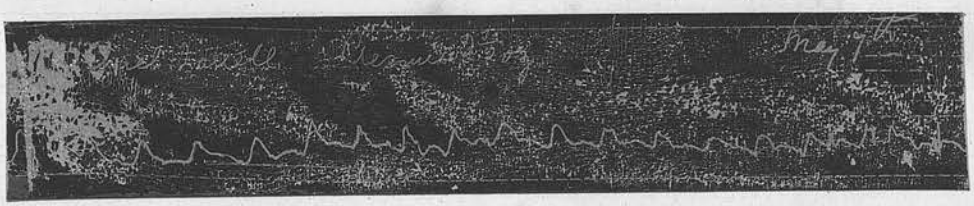

May 3rd

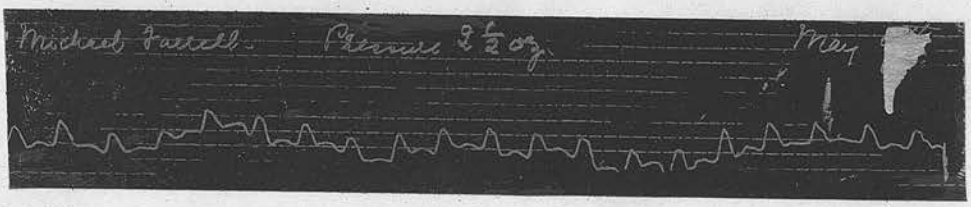

Michael Farrell Pressure oz 2½
May 4th

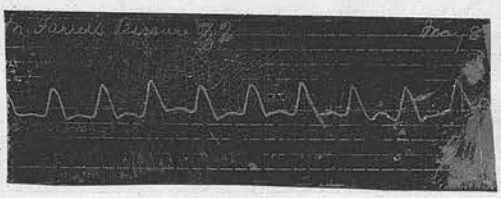

Michael Farrell Pressure 2 3½
May 5th

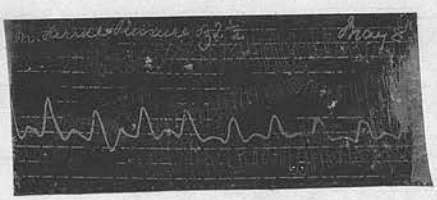

Farrell Pressure 2 3½
May 6th


Michael Farrell Pressure oz 3½
May 7th



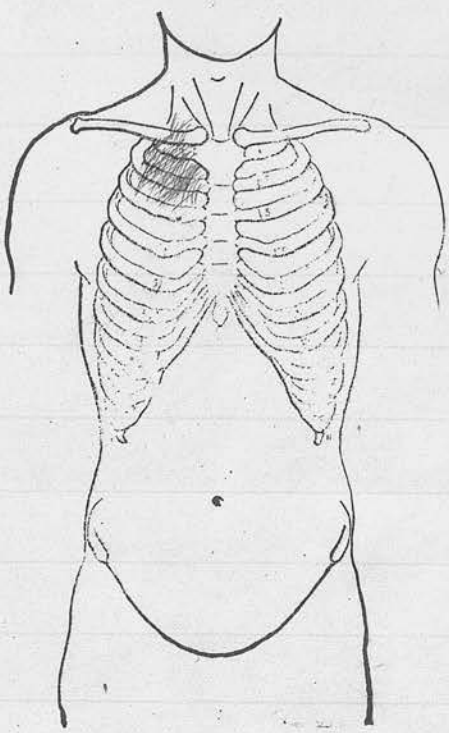


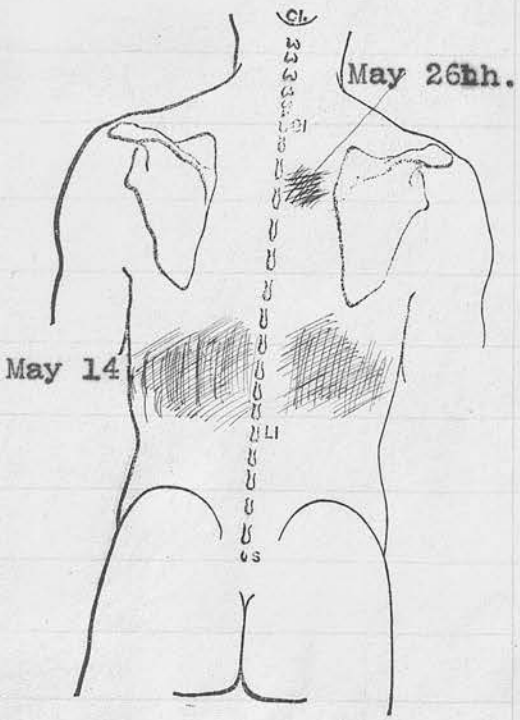


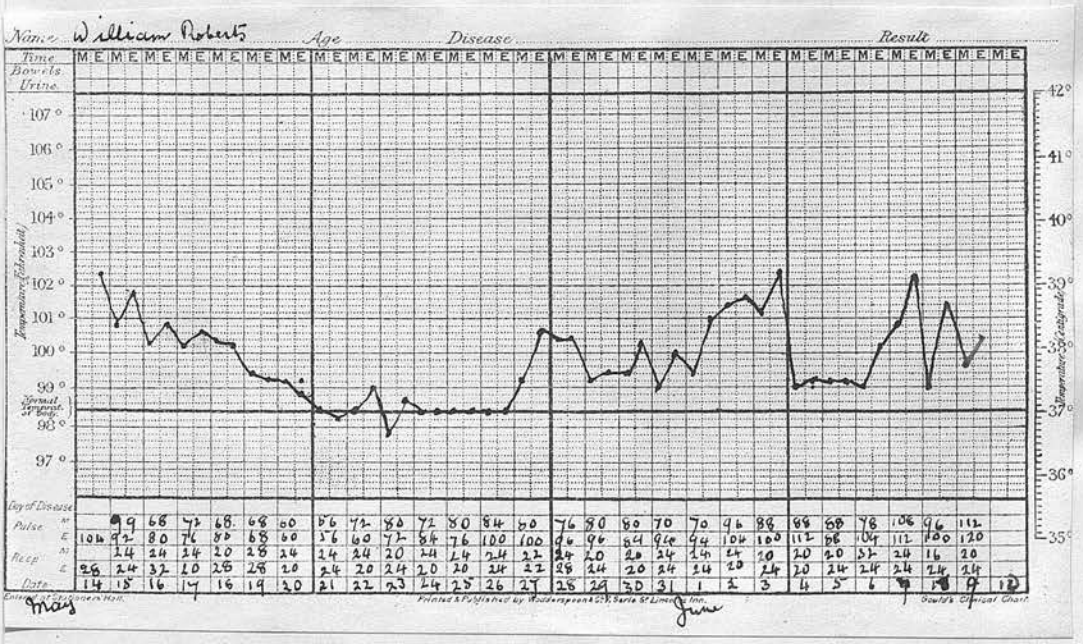


Pulse tracings show the gradual progress of cardiac failure.

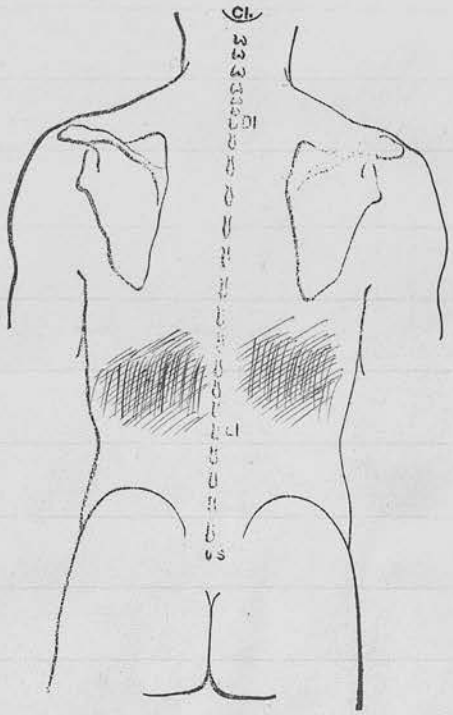
CASE 41.




May 26th.
May 14


Name William Roberts
Age
Disease
Result
Time
Bowels
Urine
Temperature Fahrenheit
Normal Temperature in Body
Temperature Centigrade
Day of Disease
Pulse
Resp
Date
May
June
Scott's Clinical Chart

CASE 42.



Name Harold Cooper. Age Disease Result

Time. Bowels. Urine.

Temperature (Fahrenheit) 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Temperature (Centigrade) 42° 41° 40° 39° 38° 37° 36° 35°

Normal Temperature of Body

Post-nasal bandage.

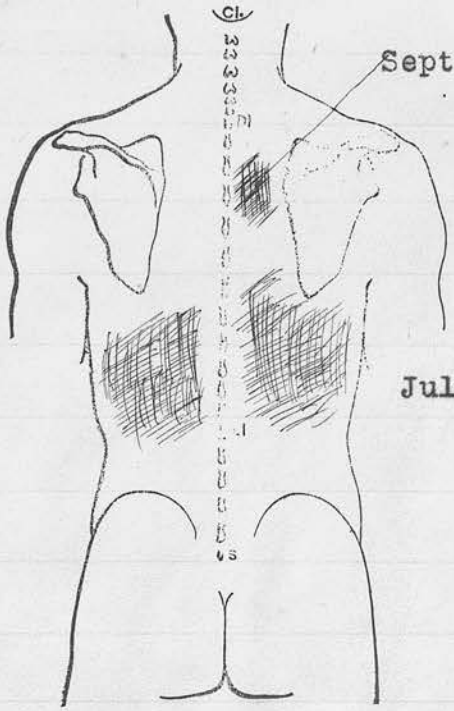
Day of Disease														
Pulse	M	112	112	120	124	120	104	108	88					
	E	120	120	128	120	120	112	104	100	104				
Resp	M	36	40	28	30	28	24	28	28					
	E	40	44	40	24	30	24	28	24	24				
Date		13	14	15	16	17	18	19	20	21	22	23	24	25

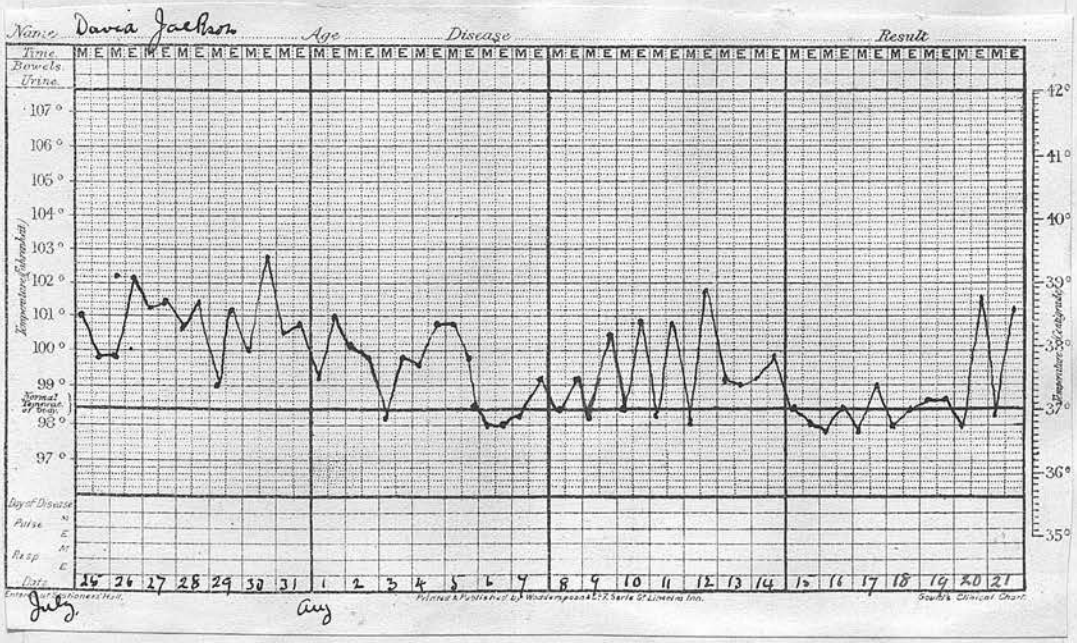
May

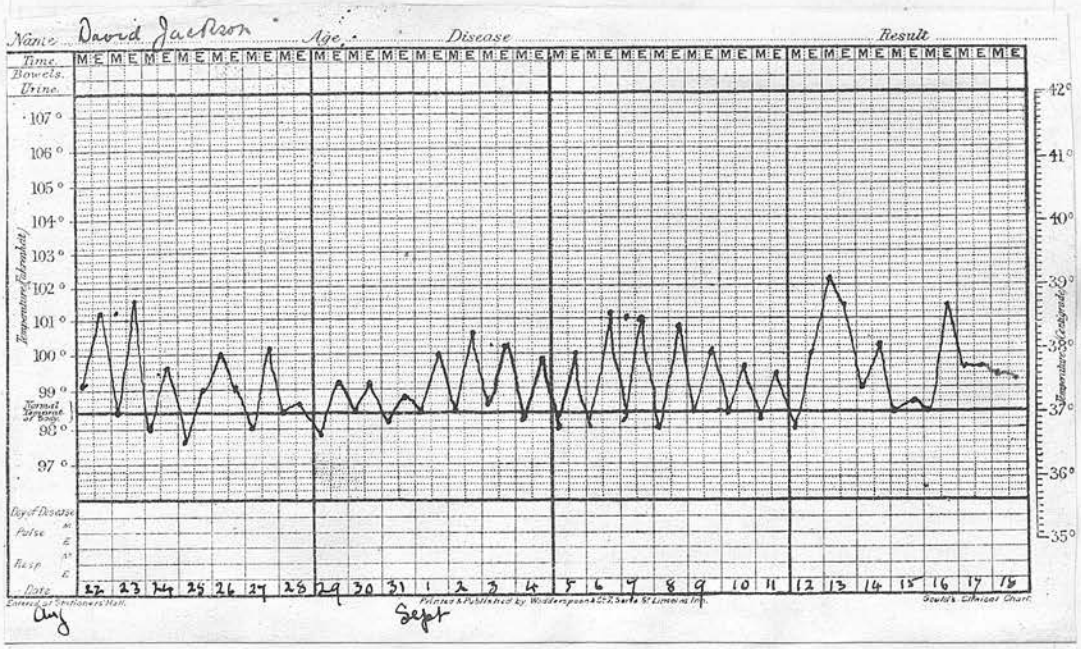
Printed & Published by Wadeson & Co. 7 Serle St. Lincoln's Inn. Gould's Clinical Chart

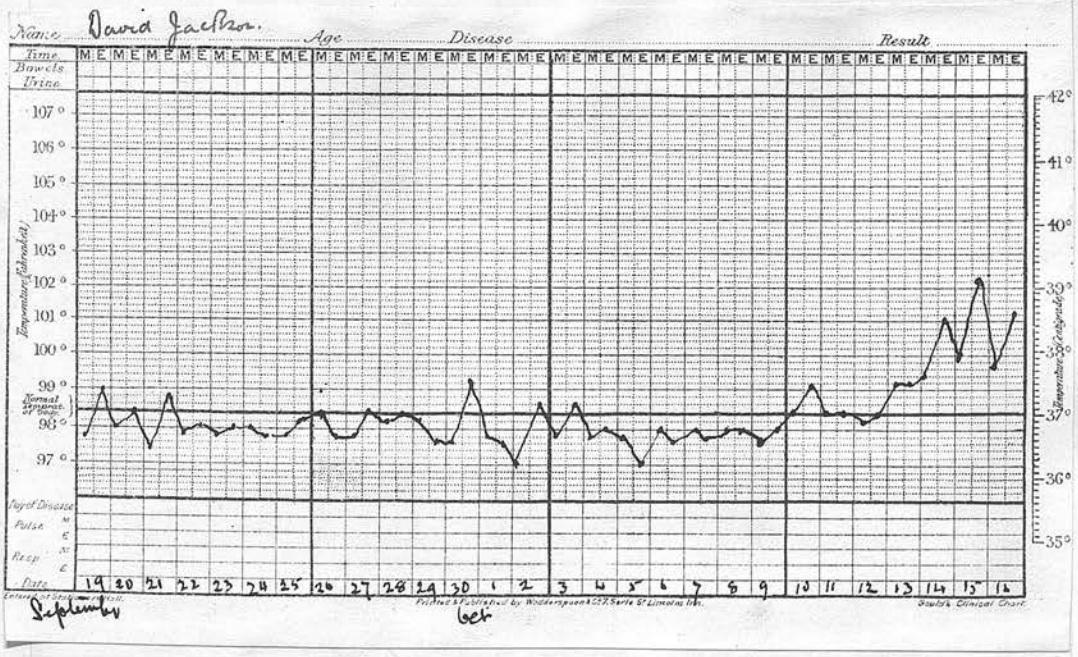
Shows the effect of the tank on the temperature.

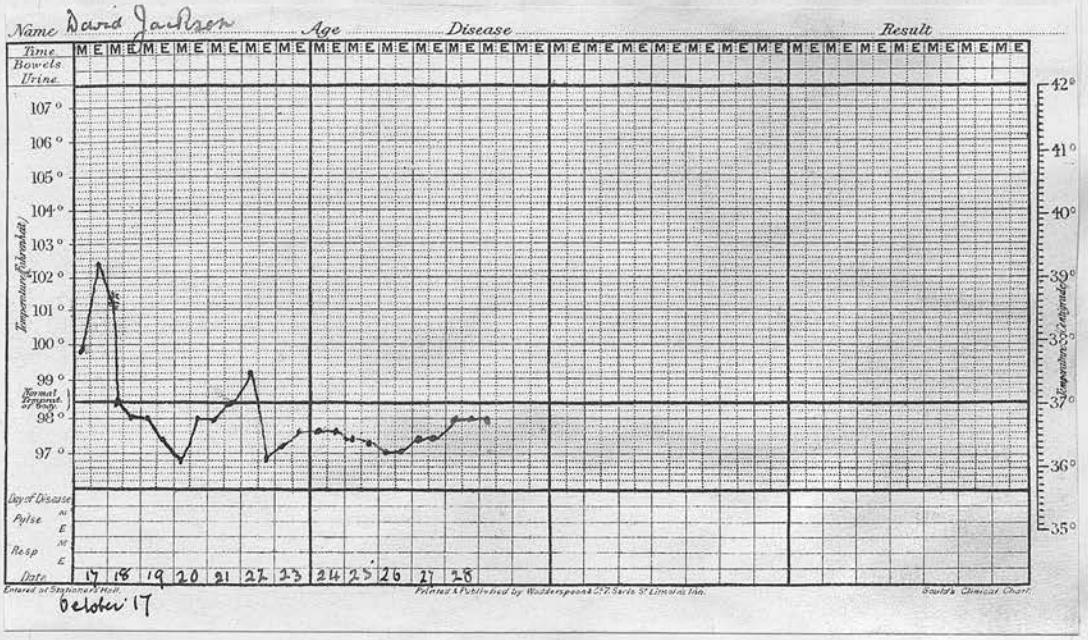
CASE 43.

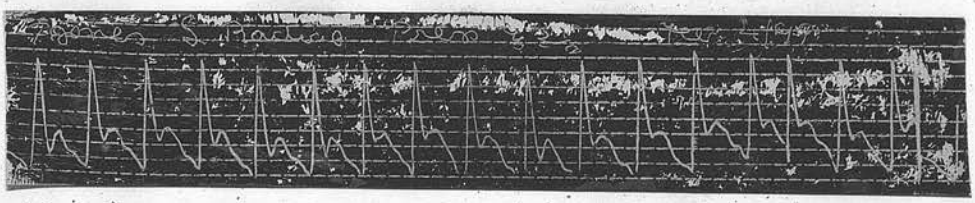

Cl.
Sept. 16th
July 26th.

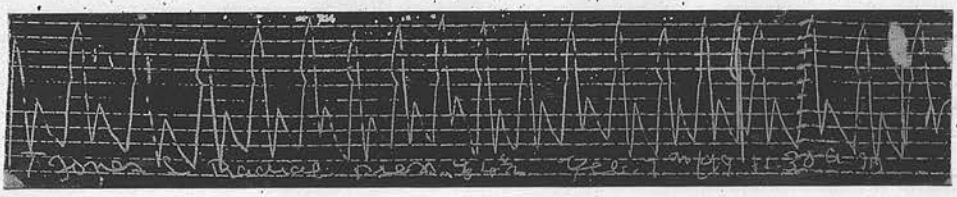

Name Davia Jackson
Age
Disease
Result
Time
Bowels.
Urine.
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
Temperature (Fahrenheit)
Normal Temperature of Body
Day of Disease
Pulse
Resp
Date
26 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
July.
Aug.
42°
41°
40°
39°
38°
37°
36°
35°
Temperature (Centigrade)

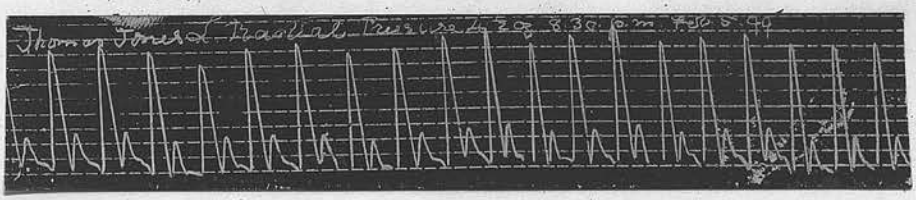

Name David Jackson
Age
Disease
Result
Time
Bowels
Urine
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
Temperature (Fahrenheit)
Normal Temperature 37 Degs.
Day of Disease
Pulse
Resp
Date
22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Aug
Sept
42°
41°
40°
39°
38°
37°
36°
35°
Temperature Centigrade
Printed & Published by Widdenpoon & Co 7 Serle St Lincolns Inn.
Gould's Clinical Chart.

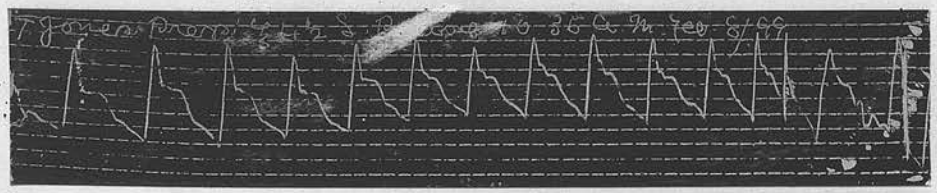

Name David Jackson.
Age
Disease
Result
Time
Bowels
Urine
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
Temperature (Fahrenheit)
Normal Temperature 37 Degs.
Day of Disease
Pulse
Resp
Date
19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
September
Oct
42°
41°
40°
39°
38°
37°
36°
35°
Temperature Centigrade
Printed & Published by Widdenpoon & Co 7 Serle St Lincolns Inn.
Gould's Clinical Chart.

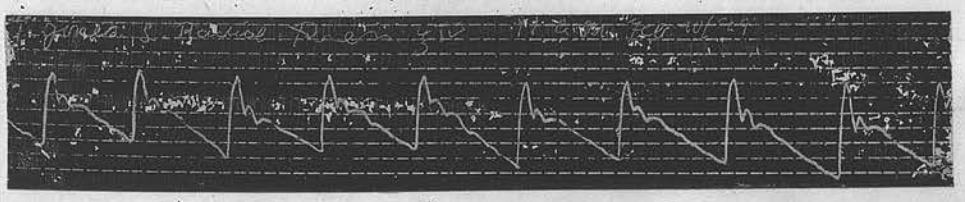

Name David Jackson
Age
Disease
Result
Time
Bowels
Urine
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
Temperature Fahrenheit
Normal Temperature of Body
42°
41°
40°
39°
38°
37°
36°
35°
Temperature Centigrade
Day of Disease
Pulse
Resp
Date
17 18 19 20 21 22 23 24 25 26 27 28
Entered at Stationers' Hall.
October 17
Printed & Published by Waddington & Co. Serle St. Lincoln's Inn.
Gould's Clinical Chart





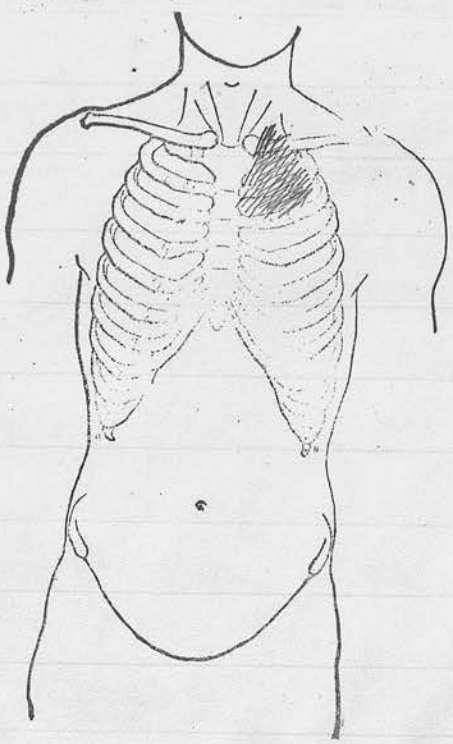


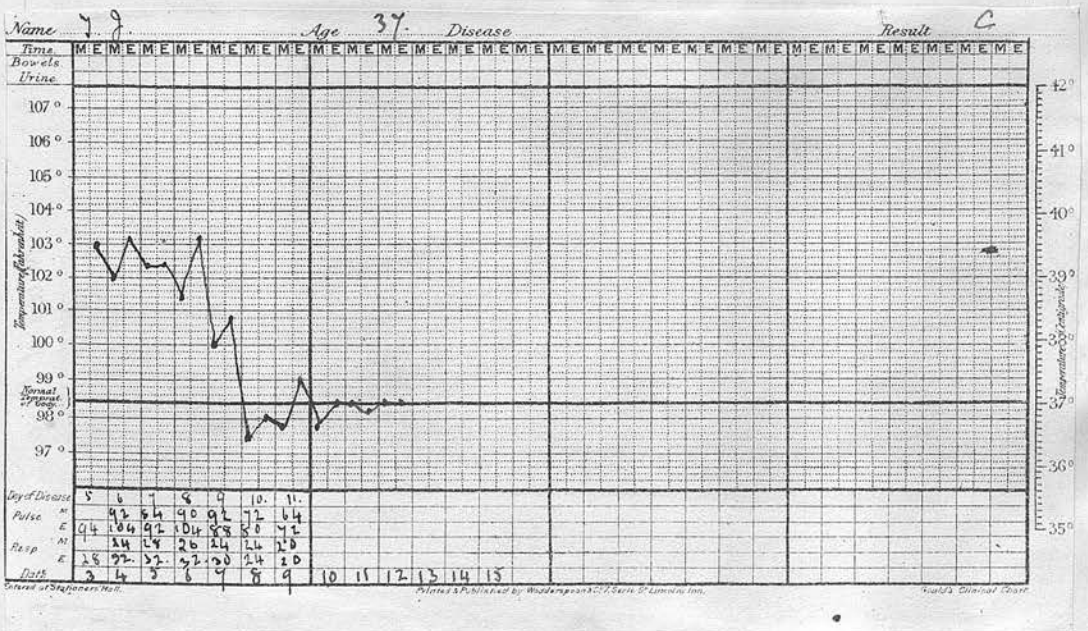


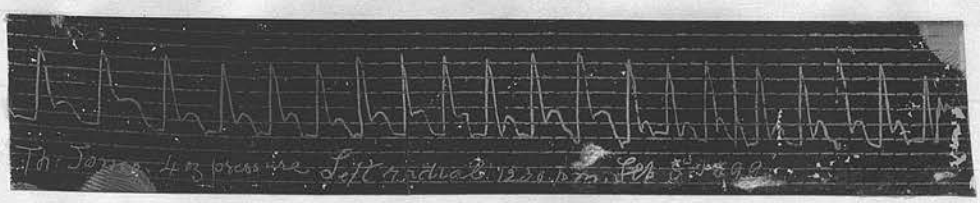


Pulse tracings show well marked dicrotism.

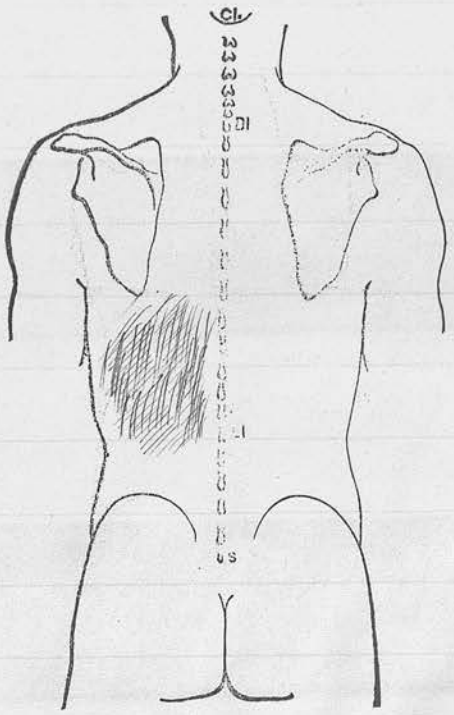
CASE 44.




Name J. J. Age 37. Disease Result C
Time
Bowels
Urine
Temperature (Fahrenheit)
Normal Temperature
Pulse
Resp
Day of Disease
Entered at Stationers Hall.
Printed & Published by Waddington & C. Keith & Linnell Ltd.
Guild's Clinical Chart


Tor Tone 4 3 pressure Left Radial

CASE 45.



Name S. M. Age 28 Disease Result C.

Time.	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Bowels.																																						
Urine.																																						

Temperature (Fahrenheit)

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

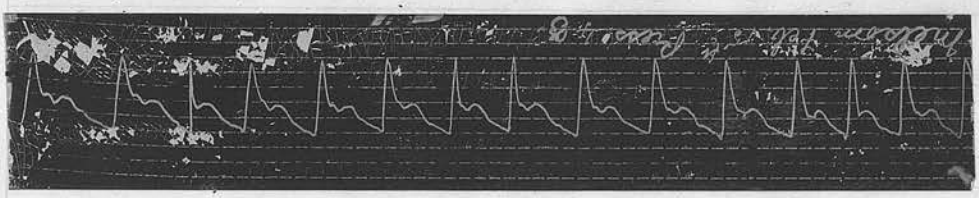
Normal Temperature of Body.

Temperature (Centigrade)

42° 41° 40° 39° 38° 37° 36° 35°

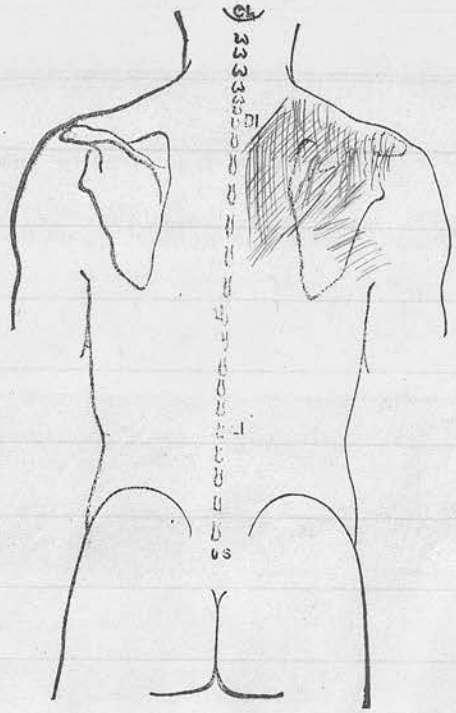
Day of Disease		7	8	9	10	11		
Pulse	M	100	84	82	74	72		
	E	96	80	86	74	24		
Resp	M	28	20	20	22	24		
	E	24	18	22	22	22		
Date		13.	14	15	16	17	18	19.

Entered at Stationers Hall. Printed & Published by Wood & Sons 210 Sixth St. Lincoln Inn. World's Clinical Chart.



Pulse tracings taken before and after the crisis;
They show well marked dicrotism.

CASE 46.



Name A. Higgins Age 21 Disease Result

Time
Bowels
Urine

Day of Disease													
Pulse	M		108	120	108	100	120	100	48	82	78	60	68
	E	120	106	110	114	108	108	106	88	88	76	76	70
Resp	M		40	36	40	40	52	58	36	28	30	26	18
	E	40	38	38	50	58	58	64	40	40	30	26	18
Date		21	22	23	24	25	26	27	28	1	2	3	4 5

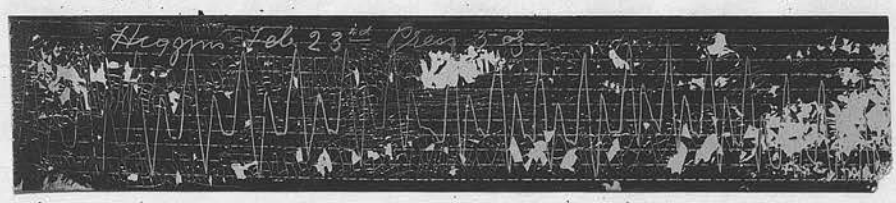
Temperature (Fahrenheit) 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°
Normal Temperature of Body
Temperature Centigrade 42° 41° 40° 39° 38° 37° 36° 35°

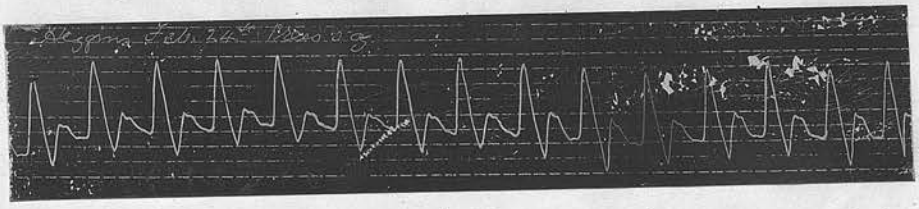
Entered at Stationers' Hall.

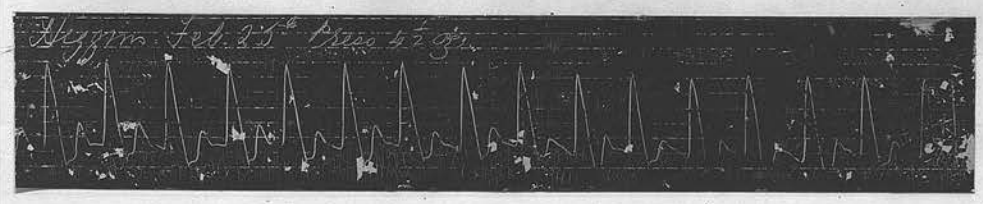
Mar

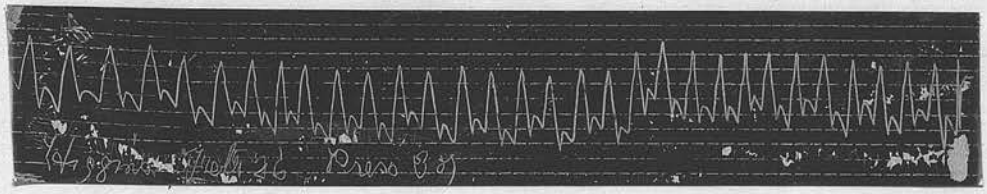
Printed & Published by Waddington & Co. Serle St. Lincoln's Inn.

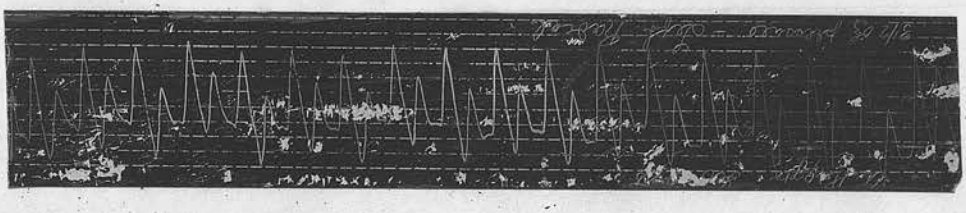
Gould's Clinical Chart.

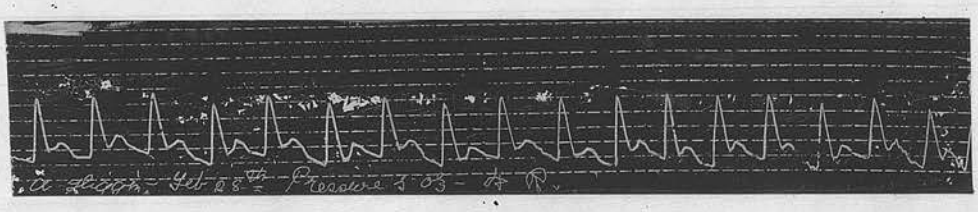

Heggm Feb 23rd Press 3 oz

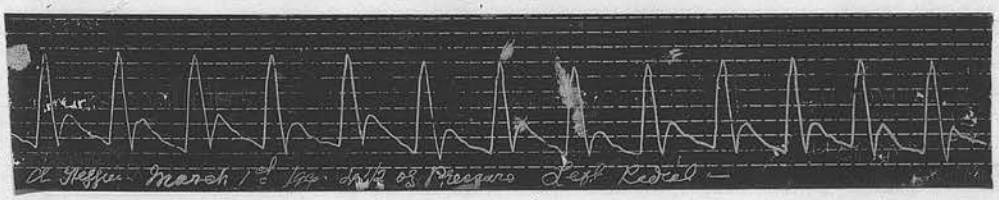

Heggm Feb 24th Press 0 oz


Heggm Feb 25th Press 4½ oz


Heggm Feb 26 Press 8 oz

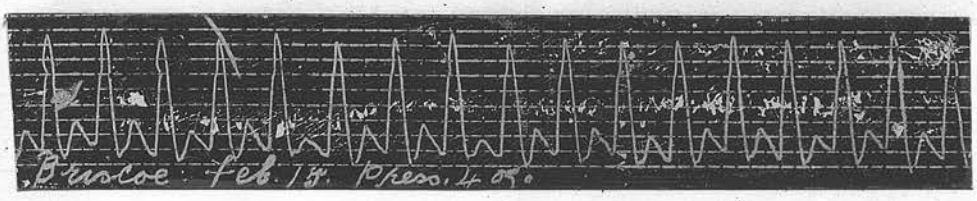


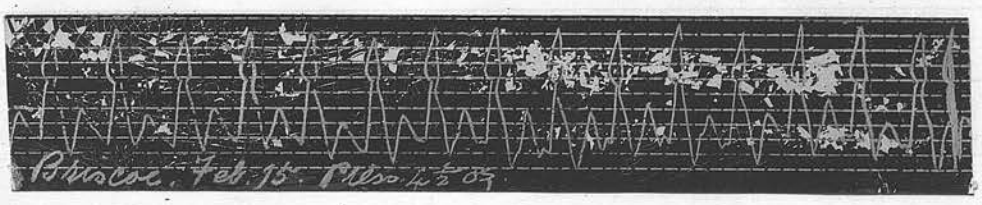


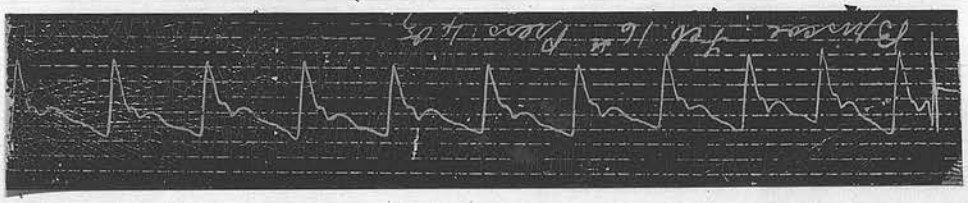


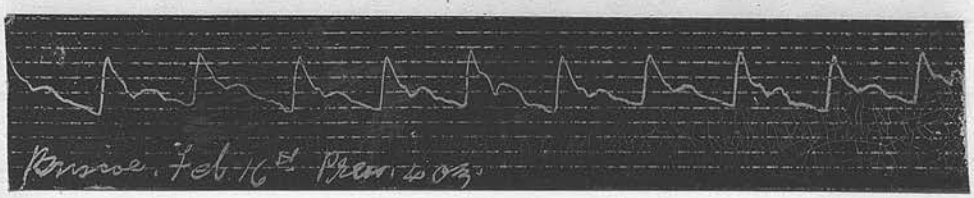
Consecutive pulse tracings of a pulse of a patient, who had a very severe attack of pneumonia, terminating in revovery. One tracing, the fifth of the series shows threatening cardiac failure, which was treated by Digitalis.

CASE 47.









Tracings of a pulse before and after the crisis.

(not noted).

CASE 48.

Name J. Lowry Age 60 Disease Result D

Day of Disease							
Pulse	M		170	130	112	140	
	E	120	132	148	140		
Resp	M		48	48	50	56	
	E	40	46	44	52		
Date		15	16	17	18	19	20	21

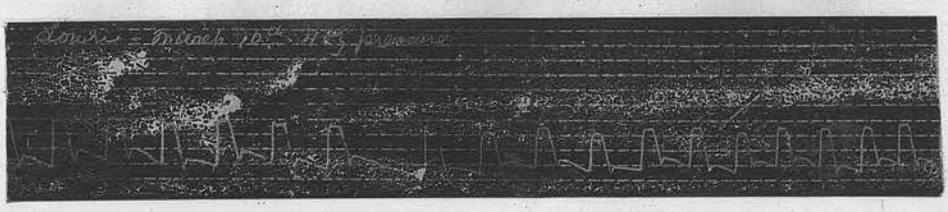
Temperature (Fahrenheit) 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

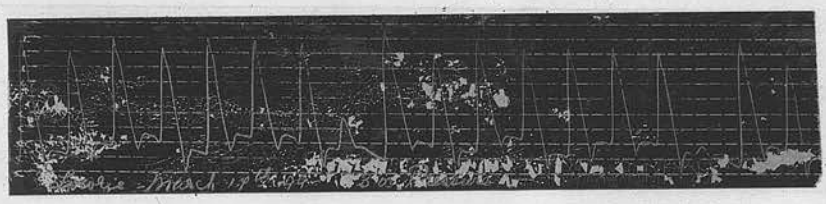
Normal Temperature of Body

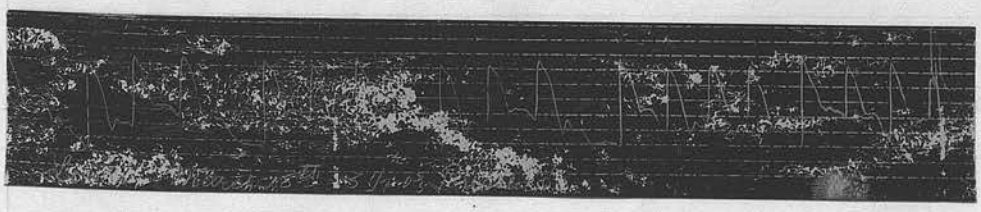
Temperature (Centigrade) 42° 41° 40° 39° 38° 37° 36° 35°

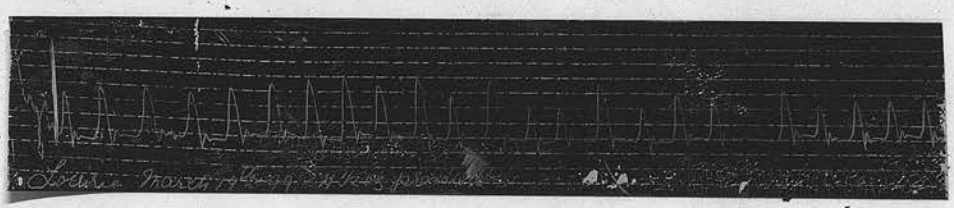
Entered at Stationers' Hall. Printed & Published by Waldenspoon & Co. Serle St. London Wm. Gould's Clinical Chart.

March









Consecutive tracings of the pulse of a case of pneumonia in an alcoholic subject, showing the gradual progressive cardiac failure; after the first Tinct. Digitalis m. 15., four hourly, was given - the effect of it is shown in the second tracing.

Out of the 46 cases, there were seventeen deaths, and one case was re-admitted afterwards with basal phthisis and typhoid.

This was a fairly large mortality; but considering the character of the cases, which applied for admission, it was to be expected.

Hospital statistics vary greatly, from about 20% to 40%. Taking the statistics of 708 cases of pneumonia collected by Hadden, MacKenzie & Ord, at St. Thomas' Hospital, the average mortality, including all ages from below 20 years to upwards of 70, was 42%. Of course in private practice the mortality is much smaller, and we may take on an average the mortality in private practice at about 17%.

Taking the ages of the cases which I had, they varied from 9 years to 68 years, the average age being 32. They were as follows:-

Between	1	and	10 years.....	1
"	10	"	20 "	9
"	20	"	30 "	13
"	30	"	40 "	10
"	40	"	50 "	8
"	50	"	60 "	1
"	60	"	70 "	4

There were no deaths below 20 years of age.

Between the ages 20 & 30 years, there were 5 deaths

" " " 30 " 40 " " " 5 "

" " " 40 " 50 " " " 3 "

" " " 50 " 60 " " " 0 "

" " " 60 " 70 " " " 4 "

Of the cases between 30 & 40 years, numbering 23, there were 10 deaths, a mortality of more than 43%. These cases usually gave an alcoholic history - their mode of living and occupation, chiefly that of dock labourers and sea men entailing considerable exposure and conducing to habits of intemperance.

On analysing the cases, as to the locality of the lesion we find:- the left base was affected in 13 cases, right base in 10, both bases in 7, right apex in 7 cases, left apex in 5, both apices in 2 cases. In one case, the whole of the left lung was involved; while in another the physical signs first manifested themselves at the right base - the following day they had disappeared and physical signs were found at the right apex, while in another case the pneumonia was central and involved the right lung.

On comparing the season of the year, it was found that there occurred 21 cases in spring, 13 in winter, 7 in summer and 5 in autumn. All sta-

tistics agree in placing the highest incidence of the disease in the spring and winter months.

In the majority of cases, the patient attributed his illness to chill or exposure to cold; others to the effects of immersion; while two gave a history of injury to the chest. In analysing the cases according to the season of the year, 34 were found to occur in winter and spring, at which seasons the climateric conditions in this country at all events are most uncertain; but if we look at the health reports of the recent polar expeditions, e.g., Nansen's (18), the health of the explorers was excellent, and there were no cases of pneumonia, yet this was in a climate, the temperature of which was usually below zero. Cold or exposure to cold cannot be looked upon as the causal agent of pneumonia; but only as a factor in lowering the resistence of the bronchial and pulmonary tissues, perhaps having a paralyzing effect on the epithelium lining the bronchi.

Some patients attributed their illness to the effects of immersion: such cases were generally admitted suffering from profound shock, cyanose, pulseless, and with a sub-normal temperature so that their power of resistance to any disease

which it might be their lot to be attacked by, was practically nil.

In an examination of 17 cases of immersion, dilatation of the right side of the heart, diagnosable by physical signs, e.g., percussion, was found in 5 cases: such cases had to fight the disease handicapped by a circulatory defect, and the prognosis in such a case was necessarily grave and bleeding as a preliminary measure would be perfectly orthodox.

Two cases gave a history of traumatism one (case 3) having his chest crushed between two barrels, the other (case 15) having fallen heavily on his chest.

The relation of injuries to the chest to lobar pneumonia has been and is a much debated point; and the present opinion of writers on the subject is most diverse. Pearce Gould (19) writing from a surgical standpoint, asserts that all bruises of the lung are followed by a certain amount of pneumonia, which as a rule is limited to the injured area and cannot be recognised unless extensive; and that traumatic pneumonia is distinguished from the lobar pneumonia by the limited area of lung involved, also by occurrence at any part of the lung without distinction. Looking at traumatic

pneumonia from a medical standpoint it seems advisable to leave out of count altogether penetrating wounds of the chest, and the entrance of foreign bodies; for when the lung is wounded by a weapon, which pierces the chest wall and especially when a foreign body, such as a piece of clothing, is carried into the lung, the blood clot that seals the wound and plugs the alveoli is very liable to become infected and the growth of micro-organisms excites a more or less intense inflammation with a tendency to spread and to run on to suppuration. Even in these cases, the inflammation may be limited in area and may after a time subside and allow the wound to cicatrise. In these cases it is the ordinary suppurative organisms which are chiefly concerned in the pathological process.

Grisolle (20) says that pneumonia sometimes follows an attempt to lift a heavy burden, and that he has observed several such cases, but he adds nothing is rarer than to see pneumonia following contusions of the thorax, whether there has or has not been fracture of the ribs. Haemmorrhage into the lungs often takes place but rarely does pneumonia follow and he summarises the question by say-

ing that the pulmonary tissue has less tendency to inflame under the action of external violence than one would a priori suppose and that pneumonia developed by traumitism remains in the majority of cases circumscribed.

On the other hand, Wunderlich (21) asserts that he has often seen pneumonia begining after severe contusions of the chest, and running a typical course. Jürgensen (22) is very sceptical regarding the occurrence of a true lobar pneumonia due to traumatism and quotes only one case among 786 cases of pneumonia. Fagge (23) denies the possibility of pneumonia being set up by traumitism. Osler (24) though he quotes no statistics, admits the possibility of pneumonia following traumitism particularly of the chest.

Sturges and Coupland (25) summarise the question as follows:- "Lobar pneumonia does undoubtedly sometimes follow injury either immediately or after a short interval. In some instances the sequel is accidental, the inflammation not being caused by the injury; but only being brought to light by its agency. In others, there is a real but indirect relationship; the pneumonia arises, that is to say, not from any harm done

immediately to the lung; but from nervous shock which bodily injury, whether to the chest or elsewhere, is apt to produce, and which in common with fatigue, destitution, and alcoholic excess, predispose the individual to such attacks. We have here in fact only a further illustration of the occurrence of true lobar pneumonia of definite duration and orderly course not as a consequence of exposure but as a real expression of some obvious morbid change."

Litten (24) who alludes to pneumonia of traumatic origin as "contusion pneumonia" saw 14 such cases in six years; he believes that they arise directly from damage done to the lung. He draws attention to the fact that the injury in such cases did not cause the patient to immediately cease work and they only sought hospital treatment some little time after the accident, when secondary changes in the lung in the shape of pneumonia began to develope. He emphasises the fact that there may be no external signs of contusion evident in severe cases, even in some that end fatally.

Harris, of Manchester, (26) has recorded a case in which, following an injury to the chest, pneumonia developed and which in its time became

infected from an old obsolescent tubercular focus in the lung - the patient dying of acute pulmonary tuberculosis in 12 weeks.

In the two cases, which came under my notice the injury occurred some days previously to the commencement of their illness; this fact and the history they gave seems to uphold the argument advanced by Litten as to the pulmonary concussion which is said by him to take place. In two other cases of injury to the chest, which came under my notice, slight haemoptysis occurred, although there was no fracture of the ribs or physical signs of pulmonary disease; hence I believe it is very probable that some rupture of the pulmonary alveoli does take place. Pneumonia as a sequel of injury to the chest has not been noticed in the accident wards of this hospital, even in cases of extensive fracture of the ribs.

Both of my own cases ran the typical course of lobar pneumonia, accompanied by in one instance the presence of jaundice; the physical signs being well marked. In both cases the sputa contained pneumococci in great abundance. In conclusion, it may be said that the general concensus of opinion seems to point to the existence of a lobar

pneumonia following on traumatism but whether directly or indirectly is doubtful. From our present knowledge of the bacteriology of the disease, one is led to believe, indirectly, much in the same way as injury to a joint may determine the site of infection in a case of tubercular arthritis.

Alcohol always a potent factor in a disease, both as regards liability to attack and prognosis, was a feature to be reckoned with in many of the cases; in fact from nearly every adult an alcoholic history either in the past or in the present could be elicited.

* * * *

Out of the 46 cases, 23 were simple, 11 were complicated; while there were 8 cases complicated by the presence of pre-existing disease.

Simple Cases:- These were cases which ran the typical course ascribed to the disease, accompanied in some cases by delirium, varying in intensity from mere restlessness to a condition bordering on acute mania. The mode of termination in the fatal cases being cardiac failure, which was either gradual or sudden, following generally on some effort of the patient, e.g., struggling or trying to get out of bed.

Cases complicated by some pre-existing lesion. These were cases which, while showing physical signs of a pre-existing lesion, were attacked by pneumonia.

Complicated Cases:- These were cases during the course of which another malady arose, and ran co-existant with the original pneumonia or followed it.

It is under these three heads that the cases are studied.

* * * *

Simple Cases. These were straightforward cases and showed most of the classical signs of the disease. All the cases in which the sputum was examined bacteriologically showed the presence of Frankel's organism in large numbers. In three of the cases the disease was recurrent; in the first case, it was the second attack: in the second, the third attack; and in the third case, it was his fourth attack. Recurrence of the disease is said to be by nomeans infrequent, and cases are recorded (24), where individuals have been the subject of 8, 10, and even 28 attacks.

The untoward symptoms most noticeable in this group of cases, were the tendency to cardiac

failure and delirium.

Cardiac Failure was the cause of death in all the fatal cases. Pyrexia is said to be the chief cause of cardiac failure and that the severe pyrexia of pneumonia, like other febrile diseases, has a more or less degenerating effect on the cardiac muscle. It also necessitates increased frequency of the cardiac contractions, in order to supply the increased demand for oxygen and to remove the excess of carbonic acid. Owing to this increased frequency the period of diastole is shortened. Then another element to be considered is the amount of pulmonary tissue involved; the respiratory surface of the lung is reduced and the ventricle forced to do more work than its normal share in order that a proper interchange of the gasses in the lung may be maintained; but this latter element as the cause of a fatal termination is rare. Have we not to consider the far reaching effects of the specific organisms themselves ? Osler (24) has recorded a case of neuritis of the arm occurring in a case of pneumonia and influenza. Illustrating as it does the possibilities of the disease, can we not go a step further and apply it to the subject of cardiac

failure ? In how many cases do we see robust adults in the prime of life, whose physical condition comparatively speaking is perfect, "sound in wind and limb" one might say, suffering from a limited pneumonia at the apex succumbing on the third or fourth day? It can not be from the extent of the pulmonary tissue involved. It may easily arise from the combined effects of the pyrexia and the toxaemia set up.

Delirium: This varied very much in intensity; in some of the mild cases the only manifestation of the delirious state was a general restlessness and rambling conversation: Then there were all grades up to the condition of acute mania.

Cases complicated by the presence of pre-existant disease.

Cardiac disease:- There were three cases in which there was evidence of cardiac disease. One, (case 4) suffering from aortic stenosis, two (case 7) and (case 32) showing mitral lesions.
Case 4 had a loud systolic murmur and thrill over the base; the murmur was rough and musical in character and on admission compensation was well nigh perfect. In his case, the heart lesion did

not seem to influence the disease at all; he had a rapid convalescence. Alcoholic stimulants were not used not indeed was their use indicated. Cases 7 & 32 had both a mitral systolic. In the former case, a boy aged 9, the cardiac lesion did not influence the disease in any way; crisis occurred on the 6th day and he made a good recovery. No alcoholic stimulants were used at all. In the latter case the patient was a police-constable with a dilated left ventricle, apex beat being in the sixth interspace two inches external to the nipple line: strong alcoholic history. Here the effects of an impaired circulation were quickly apparent, and the strain told very soon. Stimulants were exhibited freely but without effect, the patient dying suddenly while endeavouring to sit up in bed.

In the first two cases, compensation was well established and in addition to the compensation already required to carry on the ordinary work of the heart, he possessed enough reserve strength whereby to combat the disease; while in the fatal case, compensation was established in so far that the ordinary work of the heart was fairly satisfactorily performed; but in a person whose system

was already debilitated by the excessive indulgence in alcohol, the heart was unable to combat the additional strain imposed upon it by the disease, and he died as stated above.

There is no special treatment, which could be advocated for these cases; one had to watch & watch carefully the circulatory symptoms as they arose and treat them in the ordinary way. Of course, the cyanosis and other backward pressure symptoms would be relieved by venesection combined with free stimulation and on theoretical grounds rightly so; but in the latter case, only a temporary relief would have been given.

Nervous lesions. Case 31. This was a case of haemmorrhage into the Pons and tempero-sphenoidal lobe - left- and interstitial nephritis. As far as treatment went, this case was hopeless from the outset. It is of interest to note the connection between the two. Gowers (27) states that in one case of Pons haemmorrhage he found extensive congestion of the left lung.

Pulmonary lesions. Case 44. This was a case of Emphysema, admitted suffering from left apical pneumonia; in this case also there was a distinct history of infection:- he had been nursing a bro-

ther who died a few days previous to admission, of pneumonia; the remarks on the cardiac lesions apply to a certain extent on this case. This man had suffered, as long as he could remember from a chronic cough and the emphysematous charge in the lung was well marked, cyanosis was very noticeable but how often in cases of emphysema do we see well marked cyanosis, yet the individual seems to be fairly comfortable ? Whereas, if it were a case of cardiac disease, such cyanosis would be of much more serious import and signs of circulatory embarrassment would certainly be noticeable. Dr. Waters (28) a late physician of this hospital, has said that pneumonic consolidation in an emphysematous lung is very uncommon and probably acute so-called sthenic pneumonia never attacks a lung in such a condition. In this case the consolidation at the left apex was well marked; the heart also showed signs of dilatation.

In this class of case, venesection with free stimulation is indicated. In this instance recourse was had to dry cupping with the most beneficial result to the patient, who made a most excellent recovery.

Fevers:-

Enteric: Case 42, a boy of 18, was sent in as enteric on the 14th day of illness. He had double basal pneumonia, cough slight, no sputum. Widal's reaction, gave a negative reaction. Treated by continuous immersion, he made an excellent recovery.

Lobar pneumonia as a complication of enteric is by no means infrequent. It occured in 8% of the Munich cases. Murchison, in his classical work, noted it 13 out of 100 cases. Austin Flint, in 12 out of 73 cases (24). It usually occurs in the third or fourth week but in some cases it may usher in the disease, the intestinal symptoms not developing until the end of the first week or later. In these cases where pneumonia has been the primary symptom, it is very probable that the enteris fever poison has entered the system through the lungs. Difficulties of research have been a great barrier in the detection of the bacillus typhosus, and Drs. Muir and Ritchie say very truly that most observers will agree with Gaffny in attributing any failure to find typhoid bacilli in the organs of a typhoid patient to the difficulties of the search. They also state

that in the lungs there may be patches of congestion and broncho-pneumonia. In these, typhoid bacilli may be sometimes observed, but evidence of a toxic action depressing the powers of resistance of the lung tissue is found in the fact that the pneumococcus is frequently found in such complications of typhoid fever.

That, in infective diseases in general, infection may occur through the mucous membrane of the respiratory tract, has been demonstrated by several bacteriologists:- take the case of wool-sorter's disease, which results from the inhalation of the spores of anthrax by workmen engaged in sorting wool, which is liable to contain the spores of the anthrax bacillus when obtained from the skin of an animal which has died of this died of this disease. That infection occurs through the lungs is shown by the fact that these organs are first involved, the disease being in fact, a pulmonic anthrax.

As regards enteric fever, the season and climateric condition may probably have some influence but their influence cannot be accepted as paramount or exclusive; and it has been supposed that in some cases it is a true typhoid pneumonia,

viz., one directly due to pulmonary infection by the bacillus of Eberth that we have to deal with; but I do not think that the part played by the pneumococcus can be minimised in this complication of enteric.

Malaria:- This(case 4) also suffered from an aortic lesion:- He gave the history of recent malaria and he thought that his initial rigor was the commencement of an ague attack. His blood was examined and showed marked leucocylosis,some of the leucocytis contained pigment, several of the red corpuscles contained small pigmented bodies. Patient had previously had an attack and had been heated outside with quinine. This treatment he had stopped about a week previous to admission. Patient made a good recovery.

In common with the other hospital adjacent to the docks, viz., the "Royal Southern", we have in the course of the year many cases of malaria or its sequelae under treatment. Some of the cases showed a regular type, i.e., quotidiam, tertian etc, but they were the exception; the majority of cases showed an irregular type, very similar to the aistivo-autumal type of malaria, and which were followed by a prolonged convalescence on account of

the extreme anaemia left. Most of the cases had contracted the disease on the West of Africa or in Central America.

In the above case, the course of the pneumonia was scarcely altered at all, the attack being very probably aborted by the quinine. Pneumonia is said to be very common in malaria; but on looking over the statistics of this hospital and over those of the Royal Southern Hospital, I find that that view does not hold good in this country at all events. Some individuals assert the existence of a special form of pneumonia dependant directly on the malarial poison. This view, and rightly I should think, is strongly refuted by the majority of experts on the subject. Clinical evidence does not support the existence of a malarial pneumonia.

Puerperium. (case 38). This patient came in with a history of having caught a chill; had been confined a fortnight previous to admission. Sputum contained diplococci and streptococci, no tubercle bacilli. This case differed in many respects from the ordinary type of pneumonia. Patient died on the 16th day after admission, temp. never came down, the physical signs as seen in the lungs

showed a distinct migratory type spreading from one lung to the other; she had also a septic discharge from the uterius and examination of the sputum as above described, showed the presence of the streptococci, in addition to the diplococcus.

In the examination of the sputa of 39 cases of pneumonia reported by Weismayr (29), in 34 pneumococci were found alone; in five streptococci; twice with pneumococci; and three times alone. In all the pneumococci cases, with one exception, resolution took place by the 12th day, whilst in not a single streptococcus case did this occur before the 19th day and in one case not until the 40th day. According to some writers the original infection may always be with the pneumococci, but it is the streptococcus which always modifies the disease and gives it the characteristic features. Pneumococci are very short lived, whether growing in animals or in media, and if an active process goes on for some time for more than two weeks, it is fairly certain that some other organisms other than the pneumococcus, probably the streptococcus is present, the diagnosis of course being based on the examination of the sputum. A certain type of pneumonia described by German writers, has been

noted by Dr. F. P. Denny (30) who saw two cases in Vienna. The onset may be like that of ordinary pneumonia, often it is less sudden. The sputum is more purulent and less often "rusty", besides the streptococci, pneumococci are often found. The face has a peculiar septic look, the temperature is irregular, there is often no crisis but the temperature comes down by lysis often after a course of three or four weeks. The physical signs usually appear late and the local process has a tendency to wander, so marked in this migratory character that it has been called "Erysipelas of the lungs." Physical signs disappear very slowly and if recovery takes place, the convalescence is very protracted. In the above case, the source of infection was not far to seek, viz., a septic uterius and the case resolved itself into one of double infection.

Cases during the course of which another malady arose.

Pleurisy:- In very many cases, pleurisy is present in a slight degree, this being noticeable in those cases especially where the pneumonia has reached the surface. Then we come to those cases

where the pleurisy seems to be the predominant feature and which have been termed pleuro-pneumonias along with which we may have effusion. This to a slight extent occurs in many cases, and may occasionally present difficulties of diagnosis, but one ought never to be in doubt as to exploration, provided ordinary antiseptic precautions are taken, as a safe procedure.

In many cases the effusion which has exuded is absorbed. I have not seen any case of pleurisy with effusion following directly on pneumonia, which required aspiration.

Empyaema:- Only one case of empyaema occurred and it showed several peculiarities, both as regards its possible origin and pathology, which distinguished it from the ordinary empyaemas which follow pneumonia, and which are in the majority of cases due to the pneumococcus, at all events that is the organism which is usually found.

The case which I had under my care was that of a stoker, who ten days previous to admission had received an incised wound of the forehead, which on admission was in a very septic condition. On admission he also had a double pneumonia, with signs of effusion at the right base. He was ex-

plored and the semi-purulent fluid yielded a pure cultivation of the bacillus coli. The wound being examined, streptococci were found to be present:- the sputum contained pneumococci and streptococci; and the pus from his chest showed a pure cultivation of the bacillus coli communis; no pneumococci were found in the pus from the empyaema.

As a prognostic guide, the bacteriology of empyema is of great importance; when the pus is sterile on examination a tubercular origin is extremely probable. In those cases in which the pneumococcus has been present, the course and termination has usually been favourable; streptococci are sometimes found, but generally secondary to some general septic infection. The last named cases run a prolonged course analagous to those forms of streptococcal pneumonia, which have already been stated above.

As regards the presence of the bacillus coli communis, experience of recent years has tended greatly to extend the role of the parasite and according to Barlow there is no longer any doubt that it occurs in the blood as elsewhere and its presence in the blood in measles and other infectious diseases has been attested. (31).

This organism exists normally in the human body and is found individuals in a state of perfect health. Its natural habitat is the bowel. It is the most abundant and constant of those bacteria found nowmally in the human body. When taken from the normal intestine, so far as experiments on animals are of value, it would seem to be harmless; when the bowel becomes the seat of any diseased condition, it at once becomes virulent. It also appears to develope qualities for evil in instances of advanced constipation.

When the intestine is healthy this organism has little disposition to escape through the gut wall or to invade the tissues after death; if the intestine is damaged or diseased it shows an active inclination to penetrate the bowel wall and is usually found to have invaded the tissues after death.

Most observers regard this invasion of the tissues as taking place during the last few hours of life. Beco (32) who examined bodies from a quarter to three-quarters of an hour after death found that the bacillus coli had invaded the deep organs in nearly 50% of the cases examined. This invasion of the deep organs by the bacillus coli

and its escape from its natural habitat, the intestines, which was formerly thought to follow on some intestinal lesion has more recently been attributed to the spread of the bacilli through the biliary channels, it being generally accepted that they cannot pass through the healthy walls of the gut. The question of their escape and multiplication is one of some importance as bearing upon those cases of suppuration in which during life the bacillus coli was the only organism to be found and the question arises whether infection by this organism is not a common complication in such diseases.

Walker (33) has recorded a case which occurred at the Royal Free Hospital, of acute spreading gangiene of the arm, necessitating amputation and which terminated fatally. Bacteriological examination revealed the presence of the bacillus coli. In this and my own case, there was no clinical evidence of any intestinal condition which would have brought about the invasion of the organism from its normal habitat. Bunge (34) has also noted the presence of this organism in acute spreading gangiene.

Clinical evidence seems to indicate that

the field of operation of this organism is not so restricted as it has been thought, and that it will have to be reckoned with as factor in other diseases in the future. Empyema, if left alone, is usually fatal, but recovery may take place by absorption, the amount of fluid in these cases being naturally small, or it may discharge by perforating the lung, with or without the causation of a pneumothorax, or finally it may rupture externally. A case which came under notice in the surgical wards of this hospital last summer showed some points of interest :- A girl of twenty was admitted with a history of having had about ten days previously a pneumonia of the right lung; she was in a collapsed condition, almost moribund, and has signs of effusion into the right pleura; three pints of pus had been aspirated before admission which had relieved her, but signs of respiratory embarrassment again asserting themselves, she had been sent to the hospital. After admission 10 oz of foul pus were aspirated and she improved. Her right pleura filled up and operation was decided on; just before the operation, she suddenly collapsed, grew livid, had extreme dyspepsia, and died in half-an-hour.

The post-mortem showed the right lung collapsed, and a large collection of pus in the right pleura, measuring about two pints. This pus had ruptured posteriorly into the pericardium and caused death. The rest of the organs, with the exception of the left lung which was extremely congested showed a normal appearance.

Suppuration of the bronchial glands:- This, as a complication of pneumonia, has been noted very rarely, & that recently; and one is disposed to think that it occurs much more frequently than it is supposed to do and that in many cases its existence is overlooked. It is a complication with its own distinctive set of physical signs, and one of very grave import to the patient. If we look at the anatomical points, we find at the bifurcation of the trachea, in the space between the right and left bronchus, a group of glands. These glands vary from 10 to 15 in number and in size from that of a small pea to that of an almond. The glands towards the right bronchus are larger than those towards the left. Glands are also situated on the bronchial tubes, few in number and small in size; they derive their blood suply from the bronchial arteries. Afferent lymphatics reach the glands from the lung, pleura, neck and neigh-

bouring parts. Numerous small lymphatics are also met with in connection with the primary division of the bronchi. The central group of glands is in relation in front with the pericardial, the arch of the aorta and the pulmonary artery; behind with the pulmonary plexus of nerves, the oesophagus, the aorta, vena, azygos, etc. Those on the upper anterior and posterior surfaces of the right bronchus are four or five in number, and smaller than those of the central group; their situation brings them into relation with the arch of the aorta, the innominate and subclavian arteries, with the right innominate vein, and with the vena azygos, the pneumogastric nerve, and its recurrent branch. Those on the left bronchus are still smaller than those on the right. Their position gives them relations with the arch of the aorta, the origin of the left carotid and subclavian arteries, the left branch of the pulmonary artery, with the large veins and the left pneumogastric nerve, and especially with the recurrent branch.

Knowing then of the important and extensive relations of these glands, their pathology is of the utmost interest and clinical significance.

This complication manifested itself in two of the cases under my charge, and the clinical picture presented was very clear and bore a strong resemblance to a similar case reported by Sir William Broadbent (35) to which I shall refer.

Broadbent's case was that of a boy, aged 12, who had a pneumonia affecting the whole of the right lung. Instead of the temperature coming down and a general amelioration of the symptoms on the date of the expected crisis, his temperature went up and he became distinctly worse; all signs of consolidation suddenly disappeared and the breath sounds became normal, this change occurring in less than 36 hours. The boy became very ill and for a week nothing manifested itself, his temperature meanwhile keeping up. At the end of the week, during which the patient had seemed slowly to improve, the temperature rose to 102° and he became troubled with a cough, which was violent and continuous, with no expectoration. The cough was paroxysmal resembling whooping cough and defied treatment. In the course of a day or two he had a rigor with a sudden rise of temperature and evidence of pressure on the right bronchus was found by reason of the imperfect entry of air into the right lung and impairment of resonance in the right

interscapular region opposite the spine of the right scapula: the apex beat had also been displaced to the right anterior axillary line and also upward. Tracheal breath sounds were heard over the right half of the manubrium sterni; there was no evidence of pressure on the vena cava.

Patient grew worse but while coughing he broughtup a little pus, which in a short time was followed by a more copious expectoration of the same material, his temperature came down and he made a good recovery.

(Case 41). Patient had an attack of pneumonia & his temperature had come down and had remained normal for a few days, when it went up again. The clinical symptoms shown were hoarseness, which gradually went on to aphonia, pain at the root of the neck on the right side, some fulness in the same region, engorgement of the veins on that side of the neck; impairment of resonance in the right interscapular space opposite the spine of the scapular, deficiency of the respiratory murmur over the right lung, and intense dyspnoeia, worse at night, simulating very markedly the charactersof spasmodic asthma. This case gradually grew worse and died after a futile tracheotomy had been performed.

(Case 43). This was the case of empyaema, following on pneumonia previously referred to:- His temperature had fallen to normal when it rose again, paroxysmal cough, scanty sputum, some crepitations below the sternal end of the right clavical, dulness along the inner border of the right scapula opposite the spine of the scapula, and there was evidence of deficient entry of air into the right lung. These symptoms all subsided when patient during a paroxysm of coughing expectorated a large quantity of pus, his temperature came down to normal and he made a good recovery.

Comparing the symptoms, we find the following:-

Pain:- This was complained of in one case (case 41). It was referred to the root of the neck on the right side, also below the inner end of the right clavical. There was also some tenderness on pressure. In enlargement of the bronchial glands the pain is usually referred to the region of the fourth dorsal vertebra. The persistence of the pain varied, patient was sometimes free from it.

Cough:- This was the prominent feature in the three cases. It was paroxysmal and most troublesome,

harse, laryngeal in character and altogether resultless, resembling very closely the cough of pertussis. Treatment of this cough was almost impossible, the ordinary drugs doing very little to allay its severity and indeed in Broadbent's case nothing short of complete anaesthesia could relieve it. From its paroxysmal character there was no doubt but that it was due to pressure on the pneumogastric nerve. From observations made on the morbid anatomy of whooping cough, it has been supposed by some, that the paroxysmal cough so characteristic of that disease is due to the pressure of the enlarged bronchial glands on the pneumogastric nerve.

Difficulty of breathing:- This was specially noticeable in case 41. In its character it resembled very closely the features of spasmodic asthma and it occurred especially at night. Treatment had very little effect on it, morphia, inhalations of oxygen and chloroform being the only measures which at all alleviated his condition and then only as a temporary procedure.

There was no difficulty in swallowing noticed; though it is said ot occur in some cases of enlargement of the bronchial glands.

Signs of interference with the circulation were noticed in one case (case 41), the veins on the right side of the neck being distended and full.

Aphonia was also noticed in the same case and this was probably due to some affection of the recurrent lanyngeal nerve. These were the physical signs noticed in the three cases. The signs common to them all were deficient entrance of air into the lung of the affected side, dulness in the interscapular region opposite the spine of the scapula, and the characteristic cough.

In Sir William Broadbent's case, there was premature resolution of the affected lung, and the enlargement of the glands followed by suppuration was thought to be, in a measure, due to this. In the other two cases, this was not noticed, though the physical signs in case 41 were fugitive and scattered. There was no examination of the sputum in Broadbent's case; while in the case of the other two pneumococci and streptococci were found. Is it not possible that these were cases of mixed infection and that the secondary changes in the glands were in some measure due to the presence of the streptococci?

Hyperpyrexia:- This is a very rare complication of pneumonia and occurred in one case, which was fatal, the temperature in this instance rising to 106.4. Dr.Hawkins (36) of Reading, has collected 1904 cases of pneumonia complicated by hyperpyrexia; out of these only 15 had a temperature of over 106°, and of these only four recovered. He records a case of pneumonia which had at one period during the course of the disease a temperature of 108.4. The case recovered.

Tonsillitis:- This occurred in one case (case 45) which made a good recovery. Patient had a well marked tonsillitis affecting especially the left tonsil.

One can not minimise the importance of the nose and throat as the chief portals of entrance of the poisons which give rise to specific infectious diseases. Evidence is being gradually accumulated which points to the conclusion that people who suffer from nasal diseases are more liable to contract infectious diseases, especially diphtheria, than healthy persons.In Erysipelas of the face it is very frequently found that there is some chronic nasal affection and that the erysipelatous blush has started from the nose.

The rôle played by the tonsil as the point of entrance of germs into the system is now becoming more generally recognised. Gerhardt (37) has termed the tonsil a physiological wound - an inlet guarded, however, by leucocytes - which protect the system against the entrance of these germs. If from any reason the energy of the leucocytes is diminished or the tonsil is in an unhealthy condition, then the germs gain access to the system. Tubercle bacilli can probably pass through the tonsils and without giving rise to any lesion in them may produce tuberculosis of the glands in the neck. Staphylococci, streptococci, and other micro-organisms can also find their way into the system through the tonsils. Adenoid vegetations in the naso-pharynx have a similar action to the tonsils in this respect.

If we look at the Johannesburg paper, which has been previously alluded to, we will find that in the nose, and its accessory sinuses, were the chief and in some instances the only parts affected, and it will be remembered that from their observations on their first series of cases, they named the disease "acute specific rhinatis" and from their bacteriological observations on the se-

cond series of cases they came to the conclusion th e conclusion that it was due to the pneumococcus probably of a very virulent type.

The pneumococcus may be found in the mouth as a simple saprophyte in healthy subjects. M. Wetter previously referred to, has shown that the inoculation in mice of the saliva of individuals who had not been the subject of pneumonia caused pneumococcic septicaemia in 20% of the experiments. He found the saliva of those people who had suffered from pneumonia more virulent; in four-fifths of the experiments septicaemia was produced. At the meeting of the Société des Hopitaux, of Paris, April 15th 1898,(38), Berzançon and Griffon reported the result of their studies relative to the presence of the pneumococci in the throats of healthy persons having employed the serum of a young rabbit as a culture medium. They examined bacteriologically the secretion from the tonsils of 40 persons of all ages, living under the most diverse conditions, and they found pneumococci in every individual.

One case of pneumonia complicated with tonsillitis is noted in the Montreal Hospital Reports for 1898.

Dr.Wallace, of Crick (37) has noted a case of tonsillitis complicating pneumonia; examination of the sputum showing the presence of streptococci, staphylococci and pneumococci.

In the case which came under my notice, pneumococci and streptococci were found on examination of the secretion from the tonsil.

Dr. Lucas Benham (39) quotes an interesting case, where the progress of a chronic tonsillitis was checked temporarily by an attack of pneumonia. The case was that of a child aged 9 who had long suffered from chronically enlarged and insurated tonsils, which almost met in the middle line. As the pneumonia advanced, the tonsils became gradually smaller and at the heighth of the disease no enlargement was perceptible at all. The child recovered and after the crisis had passed, they gradually enlarged again; this went on during the convalescence, and by the time patient had got quite well again they had regained their former size, and had subsequently to be excised.

We can thus trace an analogy between acute rheumatism, which in some cases is preceded or runs coincident with an acute tonsillitis. And the question arises whether the pneumococcus first sets

up inflammatory mischief in the tonsil and then attacks the lung; or is it a mere coincidence ?

Jaundice:- This occurred in one instance (case 15). A young brick-layer;had a fairly well marked icteric tinge all over his body; but not so marked as in a case of biliary obstruction. Right lobar pneumonia. Had diarrhoea, but stools were well coloured, not pale. He made an excellent recovery.

Jaundice has been noted as a complication in many cases of pneumonia. It is not a catarrhal jaundice and it has been said to be caused by the deficient oxygenation of the blood, but clinical evidence does not support this theory, and the general opinion now regarding it seems to indicate that it is of the so-called haematogenous type, no doubt due to a condition of toxaemia.

Enteritis:- This occurred in one case (case 37) that of a lad aged 17. Right apical pneumonia. Had very troublesome diarrhoea, abdominal pain, and passed stools,containing mucus,undigested milk, and which had a very offensive odour.

Enteritis is said to occur occasionally in pneumonia and to it the name croupous enteritis has been given. In the Johannesberg paper, diar-

rhoea of a dysenteric-like character was noted in several cases, which usually terminated fatally and that towards the end, the motions became haemorrhagic in character.

Pericarditis:- This occurred in two cases (cases 33 & 26), both of which proved fatal. It is said to be much more common in the pneumonia of children especially when it affects the left lung. In these two cases it occurred in adults, both of whom showed a strong alcoholic history. On post-mortem, it was found there was not much fluid poured out, the pericarditis in both cases being of the plastic variety. As a prognostic sign, it is of very grave import indeed.

As to its etiology, it has been said to occur as a process of extension from the lungs; but we can reasonably suppose that it is part of the general disease. In some cases, we may have a purulent pericarditis, which also further renders the prognosis of such cases grave. Here the latter instance furnishes an analogy to the occurrence of empyema in the course of pneumonia; of course the pericardial complication being much the rarer one.

Conjunctivitis;- This occurred in one case (case 46) that of a young man, who had a sharp attack of pneumonia, from which he made a good recovery. He also had a purulent conjunctivitis, affecting both eyes, which he said had started about the same time as his illness; it did not seem to trouble him much, though the formation of pus was very free and had constantly to be wiped away by the nurse in attendance. He gave no history of any previous opthalmic disease and had not at any time suffered from gonorrhoea. The pus from the conjunctiva was examined and found to contain organisms, diplococci, similar in character to those found in the sputum, staining well by Gram's method and giving the cultivation characters of Frankel's organism.

According to Grëef (40) the pneumococcus occurred as an occasional inhabitant of the normal conjunctiva, and it may increase so as to bring about an epidemic. It is said to generally attack children, adults being rarely attacked. It is a transient malady running a benign course somewhat quickly; there is slight oedema of the lids and there is free lachrymal or muco-lachrymal discharge. The pneumococcus has been cultivated

from the discharge from the inflamed conjunctiva during an epidemic, and the disease has been produced by planting it in other sacs.

In the above case, the conjunctivitis subsided in four or five days under mild treatment.

A case occurring at Guy's Hospital has been reported by Dr. Brailey (41). In this case, the pneumo-bacillus of Friedlander, which was present in the conjunctival sac, appeared to have a causal and not merely an accidental relationship to the disease. In this instance, the presence of the pneumo-bacillus was proved both by microscopic examination and cultivation; the symptomatic disturbance was much greater than in the first mentioned variety, and it required much stronger treatment which indeed seemed to have had very little effect on the disease.

Here we have clinical evidence of the eyes being infected by both the organisms, which are supposed to have some causal relationship with pneumonia. The pneumo-bacillus showing greater virulence as regards the eye.

Abortion:- This occurred in one case (case 39) that of a young woman, who recovered with a tedious convalescence.

In common with all diseases associated with a high temperature, abortion also occurs in pneumonia and it presents no features of any special interest.

* * * *

Taking the cases as a whole, we can study the effect on various systems:-

Circulatory:- This is the system, which one has to watch most carefully, as it presents, in the majority of instances, those symptoms favourable or unfavourable, as they may be, upon which basis we form our opinion as regards the prognosis; and therefore one has to be constantly on the alert in observing those indications of cardiac failure, which are known to arise in the course of such a disease as the one under discussion and to be prepared to treat them as circumstances demand.

Signs of cardiac dilatation may present themselves, showing the gradual yielding to the circulatory strain which is thrown upon the heart, the right side of the heart being usually affected. If one listens to the cardiac sounds in a case of pneumonia where the heart is acting well and strongly, one hears increased rapidity of the sounds, but they usually preserve the normal rhy-

thym and, in the majority of cases, the second sound in the pulmonary area is accentuated. In a heart which is failing or beginning to do so, the pulmonary second sound loses this character, the rhythym of the cardiac sounds is lost and they resemble in character the sounds of the foetal heart.

Pulse:- In almost every case, the pulse was rapid, of large volume and of low tension, approaching to and attaining, in many instances, a condition of dicrotism or hyper-dicrotism, as shown in the pulstrations. When a pulse kept persistently above 120° or showed signs of irregularity, then the prognosis became very grave; as long as the pulse kept below 110, was regular in time and volume, however otherwise it might be - it might be dicrotic - in my experience the cases did well; and I do not think that dicrotism - provided the pulse rate remains below 110 and fulfils those conditions stated above - should form the pretext for pouring in stimulants, as is so often done. "Never drive a horse till it requires to be driven" ought to be the motto, and the indiscriminate use of alcoholic stimulants, as one so often sees, in the treatment of this disease, can not be too

strongly condemned. In some instances, we have a sudden failure of the pulse, its rate rising suddenly and volume diminishing, other symptoms of cardiac failure following, and the case may have a fatal termination. Taking these facts as they stand, ones attention in a case of pneumonia, as far as the circulatory apparatus is concerned, ought to be directed to the character of the heart sounds, especially the pulmonary second and to the pulse, and then from rational data, founded on the clinical observations made from them, let us judge for ourselves whether alcoholic stimulants should be given or withheld.

Blood:- Only in one case, and that specially for the malaria parasite, was the blood examined; leucocytosis was marked. Leucocytosis has been noticed in most cases of pneumonia and arguments have been adduced, from its presence or absence, to prove it to be a point of some prognostic value.

From observations made by Von Limbeck, Billings, and others (42) it has been found that an active leucocytosis during the fever indicates, as a rule, a good prognostic sign. Absence of leucocytosis is said to be a bad prognostic sign. Kanthack & Lloyd (42) found diminished leucocyto-

sis and a falling temperature to be a good sign; continued high pyrexia with a low number of leucocytes a bad sign; but persisting leucocytosis with fever was of favourable import. The presence or absence of leucocytosis per se was not sufficient for a satisfactory prognosis; but taken with the accompanying temperature (and the curves of the two were often parallel) it might prove a favourable indication and be a prognostic point of some value.

Respiratory:- In some of the fatal cases, signs of oedema, generally beginning at the bases, were found, indicating to some extent the degree of cardiac failure; and this has afforded a pretext for treatment by means of belladonna by some individuals.

Urinary:- In all the cases the actual amount excreted during the febrile period was diminished.

The chlorides were diminished, or absent, in 15 cases. Diminution of the chlorides in the unrine in cases of pneumonia was discovered by Redtenbacher in 1850 and has been subsequently worked out by Hutchison (43). In his researches he has arrived at certain conclusions: he has shown that in an attack of pneumonia the chlorides

are diminished or may actually disappear and that a true retention of the chlorides does take place. This diminution bears no relation to the degree of fever present, to the extent of lung involved or to the presence or absence of albuminuria. This diminution of the chlorides is not pathognemonic of pneumonia but may occur in other fevers - typhus and acute rheumatism - and I have had opportunity of bearing out this fact. He then points out as a test of pneumonia, it is rather of negative than positive value; their presence in abundance being opposed to the diagnosis of pneumonia.

Albuminuria:- This occurred in 24 cases and in all probability it is of toxic origin. In all the cases it had disappeared after the fever had subsided.

Ehrlich's reaction:- This was obtained in 11 cases. Authors differ much as to the diagnositc value of this test. Ehrlich, himself, said it was characteristic of measles, typhoid & acute tuberculosis. Von Jaksch' experience "would induce him to disclaim for this test any clinical importance whatever and he would specially enjoin the necessity of avoiding inferences based upon the appearance of the reaction indicated." I think

that most observers will agree with him in assigning this test a very secondary position as a reaction of clinical value and that it may be dispensed with altogether.

Alimentary System:- Except in the cases noted this system was healthy; occasionally about the crisis there was in some instances slight diarrhoea.

Nervous System:- Delirium has been referred to previously. In one case there was evidence of delusional insanity after the convalescence, which passed off and the patient made a good recovery.

Integumentary System:- In most of the cases perspiration was profuse at the crisis, and this has been classed as one of nature's remedies for getting rid of the toxic poison produced during the course of the disease and it has been lately shown that the perspiration in cases of pneumonia is toxic to animals. The elimination of bacterial toxins has been worked out by Salter (45). He injected the perspiration obtained in cases of disease into various animals, e.g., the guinea-pig. He collected the sweat obtained from four cases of lobar pneumonia, beginning with the commencing of the crisis onwards for the next four

hours. The rabbit and the mouse, the animals most susceptible to infection with the pneumococcus were the animals selected for the purpose of experiment. From half to one c.c. of pneumonic sweat was injected into mice, and this made the animals very ill, their respiration became accelerated; they sat "hunched up" in a corner of their cage, looking precisely like creatures which had been inoculated by living cultures of the pneumococcus. The sweat of one case killed two mice with the above symptoms in doses of 1/2 c.c. and 1 c.c. respectively. The critical sweats of pneumonia yielded positive results in every case examined, the animals inoculated therewith recalling the exact symptoms of pneumococcic septicaemia. Normal sweat in the same doses had no effect on mice. Six c.c. of pneumonia sweat also profoundly affected a rabbit and sent up its temperature from 102.8 to 104.6°, the rise being associated with marked acceleration of respiration.

The above experimental evidence seems to have a practical bearing on therapeutics, inasmuch as it furnishes a rational basis for the old empirical method of treatment "sweating a fever."

Herpes labialis was noted in two cases, both

of which recovered.

* * * *

TREATMENT

Nobody thinks of curing pneumonia now-a-days; and in the future one will probably have to depend on the properties of some form of serum-treatment.

During this century the treatment of pneumonia has undergone several marked changes. Formerly, and it is not so many years ago, pneumonia was treated by blood-letting and the free exhibition of antimony as routine treatment; then, the practice was revolutionised and instead of the former depressing treatment, a stimulating form of treatment was substituted, and now at the dawn of the Twentieth Century, the possibility of an "anti-serum" is becoming an established fact.

Hare (46) speaks very truly when he says "When called to guide a patient through an illness the physician should be constantly a watchman, and a therapeutist only when necessity arises;" and to no disease does this remark apply so truly as in the treatment of pneumonia.

Many cases of pneumonia require no treatment at all, this is more especially seen in children. All they need is easily assimilated nour-

ishing food and watching. But the vast majority of cases usually require some form of treatment; various lines of treatment have been taken and the first line to be considered is one which has sprung from the modern knowledge of the disease as being due to the injurious influences of the specific organism on the blood and tissues.

Quinine:- has been looked upon as having some antagonistic effect on the poison produced in this disease as have been given in massive doses. I have used quinine in some cases but merely from the effect as antipyretic and have not noticed that it materially affected the course of the disease.

Jurgensen(47) uses it mainly as an antipyretic, because he considers the pyrexia causes cardiac exhaustion and that failure of the heart power is the special and particular danger we have to combat. He says that quinine above all other antipyretic measures posesses the invaluable advantage of reducing the temperature without injuring the heart, and this it accomplishes by diminishing the production of heat and he states that when properly used quinine diminishes the temperature for 12 hours. He gave huge doses, 77 grains to an adult, 15 grains to a child, sometimes by

mouth and sometimes by rectral injection; but always in one dose.

Loomis (48) also is an ardent advocate of quinine, and in massive doses; but if we study the action of quinine we see that quinine in such large doses depresses the circulation, it arrests the diapadisis of the white cells from the capillaris, by direct action on these cells, also in such large doses it acts as a powerful depressant on the respiratory system, it also diminishes gaseous interchange in the body, probably by uniting the oxygen more firmly to the haemoglobin so that oxygenation is less easy and less active. Therefore in such large doses it tends to produce that symptom, viz., cardiac weakness, which is the thing we have to combat. Severe poisoning from quinine very rarely occurs, except in persons who have an idiosyncrasy to the drugs, but cases are on record where severe and dangerous symptoms have followed a dose of 20 grains. Dujardin Beaumetz (49) vigourously and emphatically denounces the practice of giving such large doses as unjustifiable and dangerous.

Burney Yeo (50) states "that all physicians are agreed that quinine must be given freely in those forms of pneumonia which arises in associa-

tion with exposure to malarial influences." Here he seems to hint at the existence of a malarial pneumonia but it is extremely, and indeed may almost be unhesitatingly denied, that such a form exists, and that there is no connection between the two diseases.

From my own limited experience, quinine may be used in pneumonia as an antipyretic, and I have found that it fulfilled all requirements in that direction in doses of 5 grains.

Antiseptic inhalations have been tried with no definite result. They should be more useful in cases of gangrene following pneumonia.

The treatment which is now coming forward is the treatment by means of anti-pneumococcic serum.

Serum Treatment:- Immunity against pneumonia pneumococcus and the best manner in which to insure it has been the subject of researches of G & F Klemperer (51). Their experiments, which were confined to rabbits, revealed that every nutrient medium in which the pneumococcus has been cultivated will, if inoculated, render an animal immune against pneumococcic septicaemia, even after the cocci have been removed by filtration. The power of producing immunity is more speedily acquired if the

infected nutrient medium is exposed to a temperature of 105.8° or 107.6° F. for two or three days or 140° F. for an hour or two. An interval of from three to fourteen days was necessary between the inoculation and the production of immunity. Hence the injection could not cure or act as a prophylactic, if given simultaneously with the outbreak of the disease. Serum taken from the blood of animals enjoying immunity, when introduced into the circulation, was able however, to cure pneumococci sepacaemia. The serum was injected twenty-four hours after infection, while the animal had a temperature of between 105 & 106.5. Two drachms were injected with a result that the temperature sank during the next 24 hours. In twelve successive cases, as successful result was obtained.

Foà (52) has also made further researches concerning the immunity obtained against pneumonia by injecting an attenuated culture of the diplococcus of pneumonia. Foà has obtained by means of Sulphate of Ammonia, a precipitate from the culture in broth. This being repeatedly filtered a substance is obtained, which, being introduced for three or four days into the blood of rabbits, so modifies the constitution of the animal that it

cannot be infected with the diplococcus. He also made an extract from the muscle and viscera of an infected rabbit dead from the induced pneumonia. The extract was filtered and precipitated with Sulphate of Ammonia, and then dialysed and dried. This substance, introduced into the veins of a healthy rabbit, rendered it immune against infection of the diplococcus, whilst the same preparation obtained from a healthy rabbit in the same manner, did not prove preventive.

Emmerich (53) claims that an outbreak of pneumonia may be prevented by protective injections, while the disease, if once established, may be cured by the same means. The immunity or cure is to be obtained by injections of blood or juice from the tissues of immunised animals.

Herzog (54) who has studied the experiments of Emmerich and observed his results, considers them very favourable, and they seem to him to warrant the belief that the juice of immunised rabbits as prepared by Emmerich will not only confer immunity, but also obtain cures.

Pane, of Naples, (55) has described an anti-pneumococcic serum obtained from a cow and a donkey, and with which he has successfully treated

a number of cases of pneumonia in the human subject.

Washbourn, of Guy's Hospital (55) has given us an account of the preparation of an anti-pneumococcic serum, on a large scale, and has described a method by which its strength can be accurately measured. He selected a pony for the purpose of preparing his serum, and after nine month's treatment, first with dead and then with living cultivations, this serum was found to possess marked protective powers. And it is his serum which has been used in the treatment of the few cases noted in this country.

Now as to the results of this treatment.

Pane, out of 23 cases treated, had two deaths and they were accounted for; the first was treated too late, a few hours before death, and the second case also had interstitial nephritis.

Washbourn treated 6 cases successfully, with no deaths.

Cook (56) at the London Hospital, treated two cases with it successfully; but the results seem to have been indefinite.

Harneth (57), Guy's Hospital, also with Washbourn's serum, treated a case successfully, & in this case, which from all accounts seems to have

been a desperate one, the serum used appears to have been beneficial.

Dr M. Wasserman (58) has investigated the protective powers of blood serum and extracts made from the various argans of immunised rabbits. He found that the bone-marrow contained considerably more protective substance than an equal quantity of the blood serum, while the other organ contained none. From this and from other considerations, he infers that the protective substances are found in the bone marrow, whence they pass into the blood; the spleen and the lymphatic glands only serving as resevoirs.

No definite opinion can be given as to the effect in the treatment of pneumonia in the human subject; and it will require to be tried over a number of cases before we can be assured of its utility as a theurapeutic agent.

Beyond the above treatment, which is yet in its infancy, and which up to the present time has been limited in its application, we can only have recourse to the treatment of those symptoms and complications which may arise.

Pyrexia:- a constant symptom in the disease has to be treated.

Liebermeister (59) maintains that the true danger consists in the deleterious influence of high temperature on the tissues by means of which necrobrosis of the same, is brought about; manifesting itself anatomically, as a parenchymatous degeneration. From his standpoint therefore, the fever has to be combatted at all hazards.

But, from our knowledge of the disease, one must I think take into account the part played by the toxic element which is known to exist in this disease.

Wilson Fox's experience has led him to the conclusion that a temperature up to 105° has very little apparent influence on the mortality in pneumonia and that deaths at a temperature below are nearly as frequent as above 105°. Nevertheless, taking into consideration those facts, which Dr. Wilson Fox (60) in his volume on "Diseases of the Lung," has presented so lucidly before us, one is compelled to think that a temperature of 105° is not a desirable state of affairs, and one to be avoided if possible and which therefore calls for treatment.

In this Hospital, pyrexia, whether occurring in pneumonia, typhoid, malaria or other febrile di-

sease, with the exception of malaria antipyretic, drugs have usually been avoided and recourse has been had to sponging etc.

All cases above 103° were treated by tepid or ice sponging, and the effect was usually most beneficial. There are two ways of sponging, a right and wrong one; one ought always to leave the skin surface slightly moist, allowing some evaporation, the part ought not to be dried. This sponging was done half-hourly, or oftener, till the temperature came down.

If this was not successful in reducing the temperature, the patient was put in the cold pack and kept there almost continuously till his temperature came down, or till the crisis. This was done in case 46. Dujardin Beaumetz (49) recommends the use of the cold pack for a period of ten minutes, - this in my experience is far too short a period, and if such a measure in necessary, it ought to be done thoroughly or not at all.

In two cases (20 & 42), the tank was brought into requisition:- For some years past this tank has been in use for the treatment of enteric by continuous immersion. It was first introduced by Dr. Barr, physician to the Royal Infirmary, Liver-

pool. It consists of an oblong tank, with taps for filling and emptying, and a hammock and frame for the patient to lie on. The temperatue of the water is usually 90°, never below it and usually higher. The patient, lying on the hammock, is immersed up to the neck in this, his head being raised by an air cushion. The effect on the temperature is shown in the subjoined charts.

The effect on the temperature was immediate, and permanent in so far that it kept the temperature well under control. The general condition of the patient greatly improved, pulse became firmer, face brighter, and the delirium was usually allayed, the respirations in case 42 dropping from 40 - 28. The tongue became moist. In all cases whether the tepid sponging or other methods were used, the change in the condition of the patient was beneficial in the majority of instances, and in no case was there any sign of collapse as is stated by some to occur, and if the patient's condition is watched, and the change brought about gradually, there is no danger. Of course, if the cold bath were used, collapse would be of frequent occurrence.

Besides the above cold was also applied locally in the form of ice bags. This was used more

especially in those cases in which pain in the side was a feature, and the relief given to the pain was great.

In this form of treatment, we have, if properly carried out, a remedy, which is both safe, efficacious and simple in application.

Cardiac Failure:- This symptom has been combated by a multiplicity of drugs, each of which has its advocate. If we look over the list we find the remedy which is used the most is:-

Alcohol:- One often reads that a patient has been kept alive for the last few days by brandy or whisky - let us rather say that during the last few days of life the only nourishment he received was dilute brandy or whisky. Tenure of existence under such conditions is almost open to doubt.

One cannot emphasise the fact too strongly viz., that alcohol is not necessary in every case of pneumonia and its use is contra-indicated as long as the heart is doing its work well unaided; and if those symptoms arise by which we deem it necessary that cardiac stimulants should be given, the exhibition of alcoholic stimulants should not be commenced before we find that those other remedies which are used, have been found wanting.

Alcohol produces vaso-motor paresis and causes dilatation of the vessels, and it must therefore tend to aggravate or induce conditions favourable for vascular engorgement. It must be remembered that it has its poisonous effects and that it may cause considerable nervous and general depression after its stimulating effects have passed off, and that its exhibition when given in large quantities must impose a severe strain on the already overtaxed organs of excretion.

My own experience of alcohol is totally opposed to its use as a routine, also to its exhibition in the early stage of the disease, for we thus keep it as a reserve which we can call in if occasion requires, and in such cases Ihave seen it prove of value. Many of the cases noted above were not treated with stimulants, even where the pulse was dicrotic and they did well. In those cases treated with alcohol, and when used it was always used in large doses 8 oz in 24 hours, I considered the crisis were prolonged and that change which one is accustomed to see at the critical period was not so marked, or as apparent, as in those cases treated without alcohol; the tongue was not so clean, the mental condition was not so clear, and as far as my experience went it did not tend to allay the

delirium. I found that alcohol in moderate quantities, one or two glasses of good port wine, or a half-pint of mild beer per diem, was valuable during the convalescence.

Now as to indications for its use, and that was in nearly always where I found that that benefit which one expected to ensue from the use of other cardiac stimulants, e.g., Digitalis, Strophanthus, etc., did not show itself:- Rapidity of the pulse, when it showed a persistent tendency to go up to 120, irregularity with decrotism, cyanosis, feeble and irregular respiration.

Finally, it ought always to be borne in mind that the use of stimulants should be founded on a sound clinical basis and not from the idea so prevalent that they are sine qua non in the treatment of this disease.

Digitalis:- Has been much used in the treatment of pneumonia, and the opinions as to its exact mode of action in this disease ane the dose in which it ought to be given, vary.

Niemeyer says that its use is indicated whenever the pulse is of great rapidity.

Jaccoud, considers its chief effect is in lowering the temperature. Professor Loomis states

that "it not only lowers the pulse, but lessens the frequency of the pulse, and steadies it."

The continental writers, who advocate the treatment of pneumonia by this drug, have recourse to very large doses, and in doing this they err. The doses given by Petresco (62) are something enormous. He does not hesitate to give as much as 1.80 grains of the digitalis leaves in 24 hours, and he says he has never had a case of poisoning. Other continental writers are ardent advocates of the same treatment. Balfour (63) gave chloral & digitalis, the dose varying with the age of the patient; adults 20 grains of chloral dissolved in 1/2 oz of the infusion of digitalis, subsequently half of this dose until the temperature fell. There is no doubt of the value of digitalis in this disease; but I think that it ought only to be given when necessity arises and the remarks re alcohol apply to it also, and it should only be used in those cases where there is a very rapid and feeble pulse, and in alcoholic cases. In these cases I found the effect was usually marked (see tracing) and a dose of from 10-20 m, four hourly was quite sufficient for the purpose. In one case (not noted) strophantus was substituted for digitalis

with beneficial result.

Ammonium Carbonate:- This was in the great majority of cases under my charge, the drug given in routine practice. It was given in doses of 10 grains four hourly, sometimes three hourly, and its effect on the whole was very beneficial; it kept up a constant stimulating effect on the circulatory and respiratory system, and on the bronchial mucosa as an expectorant agent. It has been said to cause sickness, when given in such doses; but I never had a case complaining of nausea; it acted as an all round general stimulant, and in cases of moderate severity was the drug used. When it was found that the pulse was failing, despite its use, digitalis was added, and then if necessary alcoholic stimulants; so that one drug was kept in reserve for the other; and I think I can at least claim for this form of treatment that it is founded on a sound clinical basis.

Strychnine:- This was the drug used in those cases where sudden cardiac failure was threatening or had supervened, given hypodermically in doses of 1/32 of a grain every three or four hours. It was very well borne and there seemed to be a tolerance for the drug. I shall refer to it again

in my conclusion.

Oxygen:- This was not used as a routine but only in those cases where necessity arose. It has been said to act in various ways, viz., that it affords increased facilities for the oxidation of the blood, and consequently the beneficial effect is extended to other systems of the body, and stimulates the nervous system. It has also been said to retard the growth of the pneumococcus,& to lower the temperature of the body.

Ephraim (64) stated in 1890 that oxygen inhalations were useful in pneumonia and phthisis, and according to Rehn, Sacchi and Pingotti, if asphyxia were threatening because of the rapid extension of the process; but only because the oxygen allowed an easier respiration. Dr. Pye-Smith (65) says in his article on pneumonia, "When dyspnoeaa is urgent and the patient apparently dying of cyanosis the inhalation of oxygen is a rational mode of treatment, and sometimes proves remarkably useful."

The teaching embodied in these two quotations seems to be the utmost limit with most physicians to the actual use of oxygen in pneumonia. In 342 consecutive cases admitted into St. Bartholomew's

Hospital (66) oxygen was used in only 10 cases, & in most of these cases apparently only as a last resort. It is evident from consideration of these 10 cases, which were desperate, that the benefit when obtained could not have been from any action on the pneumococcus in the lung, because only in one of the above cases was oxygen used for more than a few hours in all; and secondly the improvement noticed was always an immediate one. Yet there are reasons founded on the observation of facts that might lead one to suppose that if the lungs could be filled with a superoxygenated atmosphere for a considerable space of time and early on in the disease, some effect might be produced directly on the pneumococci themselves, and so on the course of the malady.

In post-mortem examination of pneumonia, it has been found that the pneumonocci exist in the greatest numbers in the youngest part of the inflammatory mischief; in parts more particularly which have not yet become consolidated, but are still in a condition of acute congestion. It is apparent therefore that a possible beneficial result might result from the exhibition of oxygen with the lungs in this condition before there had

had occurred that condition of hepatisation of the lung which we know is impervious to air; and that such means of treatment might be effective in preventing the activities of the organism in question to fresh fields of activity and might possibly obviate a certain number of fatalities; and the opinions of Kruse & Pansini (16) from their experiments on the varying influence of the pneumococcus, for they say it would be reasonable to suppose that the oxygen of the air is partially responsible for the damage to cultures and to the virulence of sputum exposed to the air and they base this statement on the fact, which they have observed that the superficial parts of agar cultures were usually very weak after two or three days, but that from the deeper parts it was possible to make a culture after two or three weeks.

My own experience has not been very favourable as regards oxygen. I have not, as I have stated before, used it as a routine measure; but rather in those cases where I thought its use as a remedial agent was indicated, viz., those symptoms of pulmonary embarrassment, cyanosis etc., with which one is accustomed to meet in certain cases of pneumonia. It was given for two or three

hours generally and the results varied; in all the cases which ended fatally, it was given as a dernier ressort, and in some cases it did seem to keep up the patient's general condition; but looking at the results reported in this country, oxygen can not be said to occupy a foremost position in the treatment of pneumonia. Latterly, in two cases which ended fatally, I followed the method of continuous inhalation, in one case for three days, and in the other for two days, and it did certainly avert the fatal issue for a time. In the first case two pints of saline solution were also transfused with the idea of diluting the toxin in the blood, after a previous venesection, and it seemed also to have a beneficial result, pro tem, the temperature falling. This method of continuous inhalation is the one generally used in the United States, and in the Massachusetts General Hospital I was told they do not wait for symptoms to arise before the exhibition of oxygen; but early in the course of the disease it is administered, and that continuously day and night. In that Hospital the method used is:- the tube from the oxigen cylinder is attached to a catheter which is passed into the nose and a gentle stream

of oxygen allowed to play into the nostrils. The method I followed was similar to above with this exception that instead of a catheter, an india-rubber tube, with a bulbous termination, was fixed into the nostril and allowed to remain there; when one nostril got irrated, it was fixed into the other. Some individuals use a mask, others give it orally with a mouth piece: well, the simpler the method, the better, and Ithink that any method which irritates or implies any effort on the part of the patient ought to be debarred. My method was simple, involved no special apparatus, and was comfortable, and the patients even when mildly delirious did not resent it, and were able to sleep during its administration.

In conclusion, as I have before stated, my experience,as regards oxygen, has not been a happy one, and its administration in this country has been haphazard, far from methodical and indeed chiefly as a forlorn hope; and I think the results quoted by some American physicians, couched as they usually are in the most enthusiastic and one might say optimistic terms, are worthy of a little consideration :- their experience being in favour of continuous inhalation, which treatment,

if we are to infer anything from the recent researches regarding the influence of oxygen on the growth and virulence of the pneumococcus, is founded on a scientific basis.

Venesection:- Of late years there have been powerful advocates in certain cases of acute pneumonia. Plicque (67) strongly urges bleeding when dysphoeia is an urgent symptom, considering that it constitutes the sole truly efficacious mode of treatment. Even when the heart is failing and the pulse feeble, it constitutes the most efficacious and rapid means of strengthening its action, Caffeine and Digitalis are useful supplements.

Where in a case of pneumonia, the exhibition of oxygen has not been sufficient to combat the increasing cyanosis, venesection should be employed early, and we should not wait till those further signs of cardiac embarrassment, e.g., oedema of the lungs, irregularity of the heart action, have made themselves apparent.

Besides venesection, other measures should be tried, viz., dry cupping, and it is especially in those cases where we have a bronchitic element superadded that dry cupping is of great value. I also found such a method in a case of pneumonia

with emphysema.

The operation was usually carried out on the median basilic vein and about seven to ten oz abstracted.

Delirium:- This was noticed in all its phases, being chiefly observed in alcoholic cases, occurring most frequently at night, and it was a most difficult symptom to treat. Sleeplessness also was a very prominent and distressing feature in some of the cases, ahd here again the same diffisulty in treatment arose. Now such symptoms as above always increased the danger in pneumonia, and consequently the presence is of some prognostic significance.

For the sleeplessness, Pulv. Ipec. Co. in doses of from 5 to 10 grains was fairly satisfactory in some cases; if this did not suffice Morphia gr. 1/6 was given hypodermically and its effect carefully watched. Besides drug treatment for the insomnia, an effort was always made to have the surroundings of the patient conducive to sleep, viz., quietness, comfort, and freedom from disturbance. As regards the use of Morphia, Professor Loomis strongly advocates the use of this drug to combat the nervous shock in the early stage

of pneumonia. He says that a patient, when put under the full influence of Morphia, is put into the best condition for resisting the shock and combating the activity of the disease. From our knowledge of the action of Opium on the respiratory and circulatory systems, this treatment does not commend itself and is not one in use in this country.

In a few cases, the tendency to insomnia was treated by Suphonal given in the earlier part of the evening in a dose of 30 grains. My experience in these few cases was disappointing and the results obtained certainly did not justify its exhibition.

Hypobromate of Hyoscine gr.1/125 was given in one case, in which the delirium almost amounted to acute mania, with beneficial results, patient sleeping for 3 1/2 hours. My experience of this drug in other cases has been far from favourable, and I have had untoward results with the above dose, added to this we have the uncertainty of its actions, in some cases it has no effect; while in others it rather aggravates than tends to relieve, a condition for which it is administered. In the above case, it was given as a last resourse.

For those cases of delirium, associated with a high temperature, the cold pack, or immersion in the tank, was most beneficial, all cerebral symptoms being more or less alleviated.

By far the best remedial agent, for delirium whether arising in association with pyrexia, alcoholism or failure of the circulation in the latter period of the disease, was a combination of Potassium Bromide, Chloral Hydrate, and Tincture of Digitalis, given in doses of 20 grains of the Bromide and Chloral and 10 to 15 minims of the tincture. It was a combination which could be repeated with safety and in most of the cases was most efficacious in securing some period of rest for the system, worn our almost in combating the disease.

As regards the use of external applications, e.g., poultices, the practice of late years has been to abolish their use altogether, as being old-fashioned; their only use is in alleviating the pain, which is sometimes a prominent symptom in this disease, and that symptom can easily be met by measures which are less cumbersome, involve less disturbance of the patient and which are not so apt to embarrass the thoracic movements as

poultices in some instances undoubtedly do.

Pain in the side Ihave always treated in robust individuals by the administration of morphia and by the local application of ice, and I have never had reason to change it; in old people I have employed the use of a turpentine stupe, sufficient to redden the skin, or the application of mustard-seed oil. In children too, where there is any pain, camphor liniment may be used in the same way with advantage.

Treatment of Complications:-

Pleurisy:- Most of these cases absorb themselves and a simply pleurisy with effusion, which follows directly on pneumonia, requiring aspiration, is rare; but if there exists any doubt as to the nature of the effusion, that doubt ought to be cleared up at once by exploratory puncture, using a fairly large sized needle, as a small one is liable to get blocked. If pus is found, it ought to be evacuated. This can be done either by aspiration or incision and drainage; if the empyema is a pure pneumococcal one, the chances are that aspiration (it may be required to be repeated in some cases) will cure it, taking care to use an aspirator with a wide needle and the usual antisep-

tic precautions.

Suppuration of the bronchial glands:- Very little can be done for this complication, beyond symptomatic treatment. For the difficulty of breathing and the harassing cough, oxygen and chloroform combined with the use of an opiate, seemed to be most beneficial. In the fatal case under my charge, tracheotomy was performed and a large catheter passed down into the right bronchus without success. We must also watch for any pointing of the pus to occur and to be ready to relieve it in the usual way.

Gastro-intestinal disorders:- were treated as usual, no special line of treatment being necessary.

Jaundice:- If we accept the modern viewof causation, should be treated as part of the disease.

Tonsillitis:- Was treated with astringent antiseptic sprays; while the Conjunctivitis yielded very easily to simple remedies, e.g., Boric Lotion.

Pericarditis:- Presented no features of treatment different to its occurrence in any other disease; leeching and local counter-irritation being the measures employed.

As regards Prophylaxis:- It has been the custom in the wards, of which I have had charge, to have the sputum mugs, and other utensils used in connection with a case of pneumonia, carefully disinfected, some 5% solution of Phenol being put in the bottom of the vessels while in use. Pieces of old lint were used as handkerchiefs and these were burnt after use and the mouths of the patient were kept clean by frequent cleansing.

All inhalers and masks, used in the administration of anaesthetics, should be carefullt cleaned and sterilised as far as possible. It has been said that ether-pneumonia may be due to infection from the face-piece of the inhaler; but that is a fact I think which is open to doubt; as these cases do not run the typical course ascribed to ordinary pneumonias, partaking more of the characters of a broncho-pneumonia, probably being due to the irritating action of the ether itself.

In connection with the subject of ether-pneumonia, I found that the administration of oxygen and the use of Atropine hypodermically was the best line of treatment in the few cases I have seen.

* * * *

CONCLUSIONS.

After a study of my own cases and a study of the existing literature, I have come to the following conclusions:-

1. In the introduction, I have pointed out the causal relationship between the organism of Fränkel and the disease known as pneumonia, and that such a relationship does exist is now scarcely open to doubt; also I have endeavoured to show, from the modern researches on the subject and also from the clinical evidence accumulated during the last two or three years, that lesions, referrable to the action of the pneumococcus, are not limited to the lungs alone; but may occur in other parts of the body, and that a generalised pneumococcic infection may occur in some cases; these lesions varying in magnitude, according to the varying virulence of the organisms.

2. That it is possible that other organisms, e.g., streptococci, bacillus coli communis, etc., may occur with the pneumoccus and that their presence, not only in the disease itself; but in the complications, may be of great prognostic significance.

3. That traumatism as a factor in the causation of the disease, has to be reckoned with.

4. That in "Suppuration of the Bronchial Glands" we have a complication characterised as it is by a distinctive set of physical signs, which I am inclined to think is not diagnosed as frequently as it occurs, and that when it does occur, there is probably double infection, the streptococcus also participating in the morbid process.

5. That Ehrlich's reaction as a diagnostic test is valueless.

6. That alcohol is not a sine qua non in the treatment of this disease, and that dicrotism of the pulse per se does not indicate their use.

7. That the use of oxygen should be studied on another basis, not only from a mere question of its cardiac and pulmonary therapeutics; but also from its inhibitory action on the growth of the pneumococcus, and that its administration should be conducted in a scientific manner, not in the hap-hazard way with which one is so familiar in this country, ushering in in many cases the last few

hours of the patient's life.

8. That the beneficial effects of Strychnine, in the treatment of pneumonia at all events, have been exaggerated, for Idid not find it to be of much service; and I am inclined, for my own part, to relegate it to a secondary position as a therapeutic agent in this disease.

9. That, though I have not used the anti-pneumococcic serum, it would seem to be the treatment, though still requiring much research, to which one will have to turn in the future; but as to what its effect will be in those cases where other organisms are present will require some consideration.

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E R R A T A .

For "Erhlich" read "Ehrlich."